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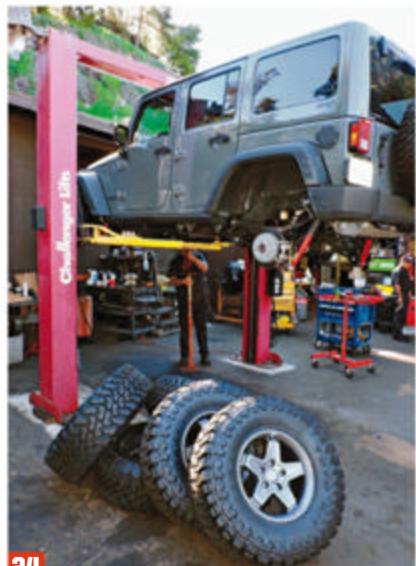
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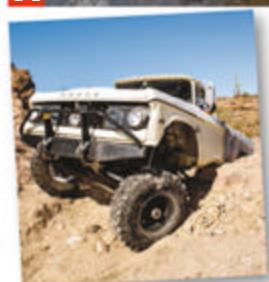
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**ON THE COVER:** Jay Kopycinski's flexy Dodge photo scratches that vintage itch we all need scratched.

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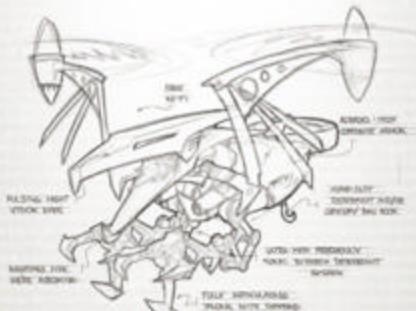
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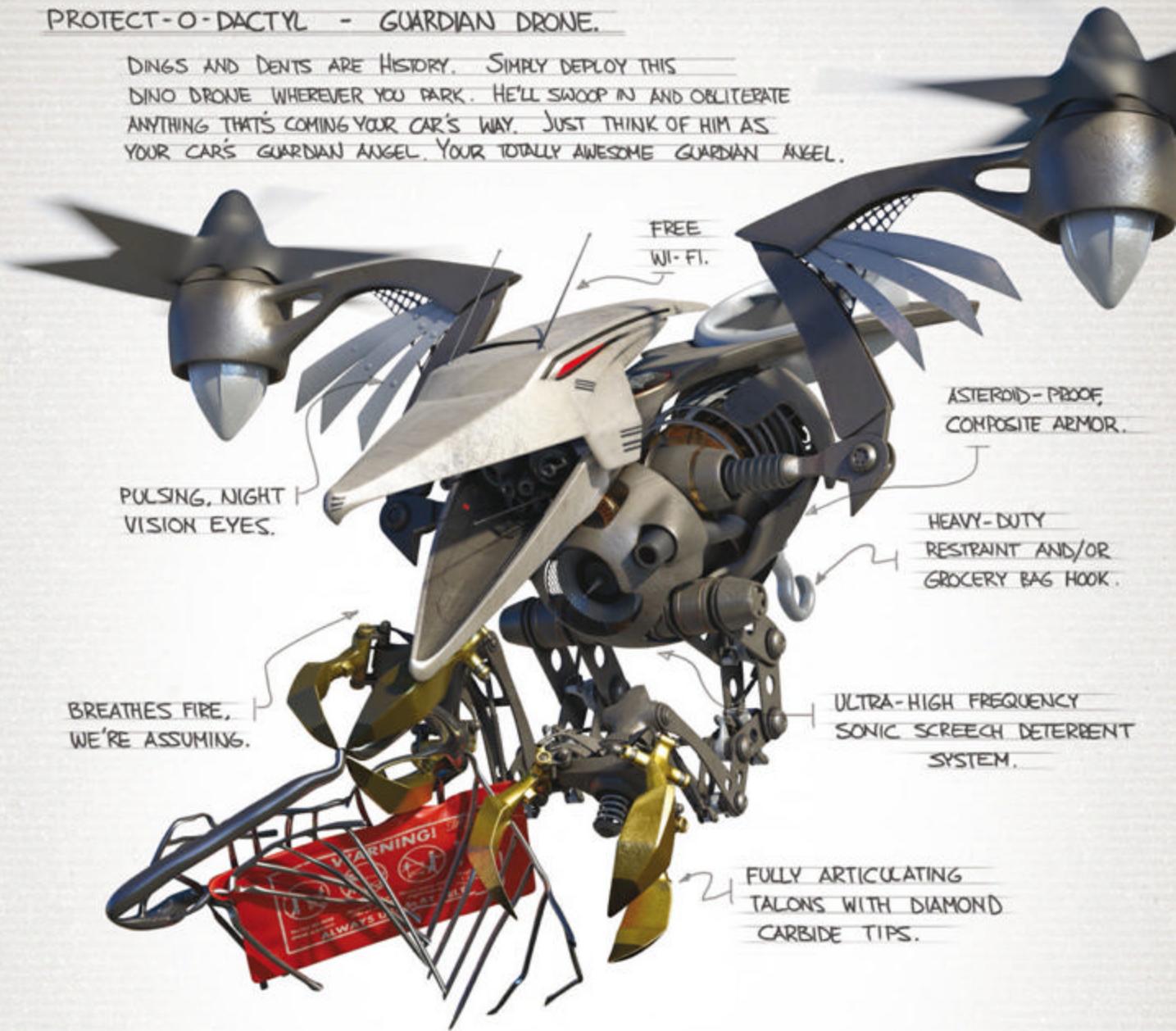
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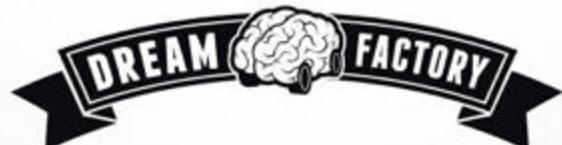


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## Old Stuff Aura

I'm not a doomsday prepper with a stash of MREs buried in my yard. I don't think zombies will one day spring up out of the ground and come for our brains. I don't really believe the government will leverage a hostile takeover of American citizenry and send us all to live in FEMA death camps. I don't wear tinfoil on my head to ward off space satellites reading my mind, and I don't think my iPhone camera and microphone turn on at random intervals so the decedents of Steve Jobs can know how I like my eggs cooked. Maybe I'm wrong. Who knows. What I am, however, is a shooting enthusiast. There are some who would believe the simple fact I like plinking tin cans and old auto parts makes me guilty of all the aforementioned kookery, but in reality I just enjoy the smell of spent gunpowder and trying to hit the ten ring. And even though I have a pretty good collection of hardware, I always seem to want just one more.

As a gun enthusiast, I have some new polymer-frame, striker-fired pistols and modern long guns, but my favorites are my older pieces like my WWI 1915 Enfield rifle and old single-stack semi-auto pistols and simplistic revolvers. Just this morning I was searching gunbroker.com for an original, shootable .32-caliber Colt 1903. For some looking in from the outside it may seem silly to search out a 90-year-old pistol that costs twice as much and has half the knock-down capability as many modern alternatives, but that's the way I operate. Maybe it's all those Bogart movies I enjoy. The older stuff just has an aura about it the new firearms can't come close to matching. And it's not just firearms, and it's not just me. It got me thinking about classic-leaning parallels in my automotive dealings and wondering how many *Four Wheeler* readers feel the same way.

**Closed-Knuckle Axles:** You can grab an open-knuckle Dana 44 and it'll have internal-body hubs, stronger axleshafts, and way more locker and gearing options. But

there's just something cool about knowing you've got two steel balls full of knuckle pudding under you (gosh, that sounds dirty). And those cool vintage external-body old-school hubs just have style. For my vintage  $\frac{1}{4}$ -ton rides, I'll take a Dana 25 or Dana 27, thank you. Or maybe an M-715 Dana 60 for a fullsize something-or-other.

**Drum Brakes:** Sure, disc brake conversions abound for almost any application, but what kind of guy keeps drums on anything? This guy. I'm not recommending panic stops with 35s and 9-inch drums, but if you've got four properly adjusted 10 or 11-inch drums

and 33-inch or smaller tires, there's no huge need to swap to discs.

**Carburetors:** One of the best running off-road rigs I ever owned used a Rochester Q-Jet carburetor I pulled straight



off an early '70s junkyard Cadillac. Fuel-injection is sexy, but a carburetor can get you home even if your fuel pump dies.

**Low-Back Seats:** Safety should be a huge deal to anybody, and high-back seats are definitely safer in the event of a crash. However, something about driving a vehicle with a low-back bench seat just puts me in my happy place.

**AM Radio:** I'd kick anybody square in the plums for hacking the dash of a vintage vehicle to install a modern stereo. One of the most stress-reducing sound systems of any vehicle I ever owned was the original factory push-button AM radio and single speaker in my '72 Jeep pickup.

**White Wagon Wheels:** Sure, I've run tons of fancy aluminum beadlocks, but I still really dig the look and budget of white steelies—especially if they're big ones like 15x10 or 15x12 on a fullsize pickup or SUV.

Are you a vintage-anything aficionado? Upload your photo on my Instagram at @hbombindustries and add the hashtag #fourwheelermag for a chance to win some stickers and magazine plates for your 4x4.

**-CHRISTIAN HAZEL**

**CHRISTIAN.HAZEL@FOURWHEELER.COM**

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## SIX-APPEAL

I just received and read my latest issue of *Four Wheeler*. Attached you will find pictures of my '80 F-350, which I have owned since new. It has a 300ci Six with a T-18 BorgWarner four-speed, along with a Dana 70 rear axle. And yes, it is 2WD. It would be 1985 before 4WD would be available in this size truck. I do own a Super Duty F-350 4WD pickup. In regards to your article, my memories continue as my truck is still in use, from plowing snow to God only knows the thousands of tons of materials over the last 35 years it has hauled. The drivetrain is all original with a little over 120,000 on the odometer.



And to the purist, I did upgrade from the original grille and the raised-letter hood.

**CHARLIE BISEGNA**  
MARBLEHEAD, MA

## FRED'S DEAD?

You had a delightful story in the June '15 issue entitled "April 1982: Battle of the Inline-Sixes." It certainly brought back memories, but for me, those memories go back even eight more years to 1974: the year in which my wife and I decided that the most practical vehicle for the money would be a pickup truck, even initially for urban and suburban living. Nobody was thinking of pickup trucks for non-commercial use back then, but the question was: which one and how do you know what's good?

Well, that was the year that Dodge came out with the D100 "Club Cab", a little cab extension with extra windows and side-facing jump seats. Quite a novelty back then, but it was great for kids. It was the first pickup to offer that option. We ordered it with a 225ci slant-six inline engine and NP435 four-speed manual transmission with a "granny" gear.

That poor truck! Not only did I build an ugly home-made wooden camper on the back (an unsightliness about which my neighbors would

never fail to remind me), but we very quickly started construction of a home-site in the Adirondack Mountains, which that overtaxed (abused?) vehicle often had to haul an additional 1,500 pounds of construction materials, as well as pull a 5,000-pound gravel trailer for road grading. The granny gear was amazing for chugging up slippery, off-road, inclined trails with all that stuff, and the vehicle's endurance and reliability were legendary. It soon became a trusted family member named "Fred."

As fate would have it, I got another job in the western part of the state in 1979, and we had to move away from my beloved mountain. Yes, "Fred" came along, doing much of the moving of household goods those 200 miles westward, where we stayed for about 3 years. But quite suddenly, another job offer came up in Wisconsin, and more moving trips were in the making during 1982. Unfortunately, this time "Fred" was hit from the rear on the Ohio Turnpike (I-90) during one of those trips by a speeding tire-delivery truck from Akron, Ohio. "Fred" took the beating, and my family got a severe jolt but survived. He was still drivable and made it to our new home, looking perhaps a bit strange, worse for wear, and misaligned. With a little bit of frame straightening and some bodywork, "Fred" was right back to providing

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camping, hauling, and off-road/on-road adventures once again.

In about 1989, at about 150,000 miles, "Fred's" slant-six engine was diagnosed as "feeling a bit tired," a conclusion from more than one mechanic. So, by good fortune, we found a junkyard AMC Matador with a low-mileage and flawless slant-six engine (yes, another one!), but this time the engine came with a two-barrel carburetor. And that whole package for only \$300! During all that time, the transmission remained in perfect condition, having been fed a diet of Mobil 1 oil. Outside of the engine swap, the only other mechanicals replaced were shocks and brakes. Oh, and ball-joints, done by a rip-off artist who convinced me I needed new ones (I later found out otherwise).

I kept "Fred" until 1996, at which time we were up to 225,000 miles and 22 years on the

clock. So, a new 1996 Dodge Ram 1500 Club Cab was ordered. I had a little good-bye party in the parking lot of my new Wisconsin employer, with several of my friends and colleagues standing outside to offer respects and to see "Fred" ride sadly into the sunset. In the photo, I have the beard and the dark plaid shirt.

But ironically, that is *not* where the tale ends! Knowing that I couldn't get much money for him, I donated "Fred" to a monk who used the truck to haul feed for his goats and also haul his prized Nubian's to shows, to help make an income. After three more years of that work, the monk (a hermit) gave up on his ornery goats and gave "Fred" to a local farmer to haul firewood timber out of his "Back 40." That was about 1999 or 2000. About 2005, when I asked the monk about the fate of "Fred," he smiled and said, "The camper is gone now, but the farmer built a wooden flatbed on the

frame and 'Fred' is still being used as the primary 'Back 40' logging machine." Who even knows what "Fred" is doing now.

**BERNIE KRESSNER**  
APPLETON, WI

**I was (very pleasantly) shocked and amazed and the volume of mail we got about revisiting that old story pitting inline six-cylinder Dodge and Ford pickups against each other. I always admired the utility-oriented nature of those two engine offerings. Most of the time the trucks sporting those engines had roll-up windows, rubber floor mats, and manual transmissions, and owners who put 'em to work. Judging by the positive response from everybody, I'm not the only one who admires these workhorses. Maybe it's time to start searching for a good ol' '70s or '80s inline-powered Four Wheeler 4x4 project. FW**

## WHERE TO WRITE

Address your correspondence to **Four Wheeler, 831 S. Douglas St., El Segundo, CA 90245** or send an email to [christian.hazel@fourwheeler.com](mailto:christian.hazel@fourwheeler.com). All letters become the property of Four Wheeler, and we reserve the right to edit them for length, accuracy, and clarity. The editorial department can also be reached through the website at [fourwheeler.com](http://fourwheeler.com). Due to the volume of mail, electronic and otherwise, we cannot respond to every reader, but we do read everything.



**MAXXIS**  
greatness from within.

BY TORI TELLEM  
EDITOR@FOURWHEELER.COM

# IRPIVI

AUTOMOTIVE NEWS



## THAT'S INTERESTING

Does being married affect your vehicle insurance? You betcha. Insurancequotes.com did a study and learned that based on age, your marital situation, and gender, rates can vary more than 50 percent. For example, comparing

a married and a single 20-year-old woman, the single pays 28 percent more, while the same scenario with males equates to 25 percent more for the spinster-man.

Ralph Gilles has been named head of design for Fiat Chrysler and member of the FCA Group Executive Council. His previous work included president and CEO of SRT and CEO of Dodge.

Ram 1500 Texas Ranger concept—a partnership between Ram Truck, Texas Rangers, and the Texas Ranger Hall of Fame and Museum. A nod to this ven-

ture can be found via the Lone Star Ranger badge, as well as special emblems and design cues inside. Production is possible for this truck, but for now it's one-of-one.

Know how many miles Americans drove in 2014? Would you believe 3 billion? Then don't because it's actually 3.02 trillion. That's up 1.7 percent from the previous year and the highest since 2007, according to The Detroit News.

Daimler Trucks North America started a project back in 2010 called SuperTruck, which was

supported by the Department of Energy and a \$40 mil grant. The goal was to study ways to improve technology and fuel economy in large-scale trucks. So far, test drives have shown a 115 percent freight efficiency improvement over a baseline truck—to the tune of about 12.2 mpg.

VW is expanding its Chattanooga manufacturing facility as prep for an all-new midsize SUV. Almost 513,000 square feet will be added to the current plant.

Four Wheeler's owner, TEN: The Enthusiast Network, has acquired TORQUE.TV, which will give motorsports and other vehicle-related programming to our sibling Motor Trend's motortrendondemand.com.



# IS IT TRUE?

- ➲ Nissan + Mercedes-Benz = M-B pickup?
- ➲ Alpine Climb buggy competition series coming in 2016? On the European ski pistes?
- ➲ No midsize pickup from Ram?
- ➲ Toyota took out a patent for eyelid detection device to determine driver drowsiness?
- ➲ Rolls-Royce, an off-road vehicle called Project Cullinan?
- ➲ Finally, there's legit talk that a VW pickup is coming to the U.S.?



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## ↑ '16 Range Rover SVAutobiography

**M**eet Range Rover, SVO. That's right. If you didn't know it, Land Rover's got a Special Vehicle Operations unit, and its '16 SVAutobiography is the most potent Range Rover ever made in the brand's 45 years—550hp from the supercharged 5.0L V-8. It also features two-tone paint. Otherwise, it's a lot of luxury, with things like a "chiller compartment," solid aluminum coat hooks, mohair mats, armrest adjusters, and "Event Seating"—seats stuffed in the cargo area that can be deployed to seat two adults on the tailgate-lower. And it'll run \$200,000?



## ↑ A Drone Landed in a Ford F-150

**F**ord Canada conducted a fun stunt. Pro drone pilot Chris Bacik landed his drone in the bed of a '15 Ford F-150 in the darkness. Why? A lengthy plug for the new box lighting. You can watch the video on YouTube.

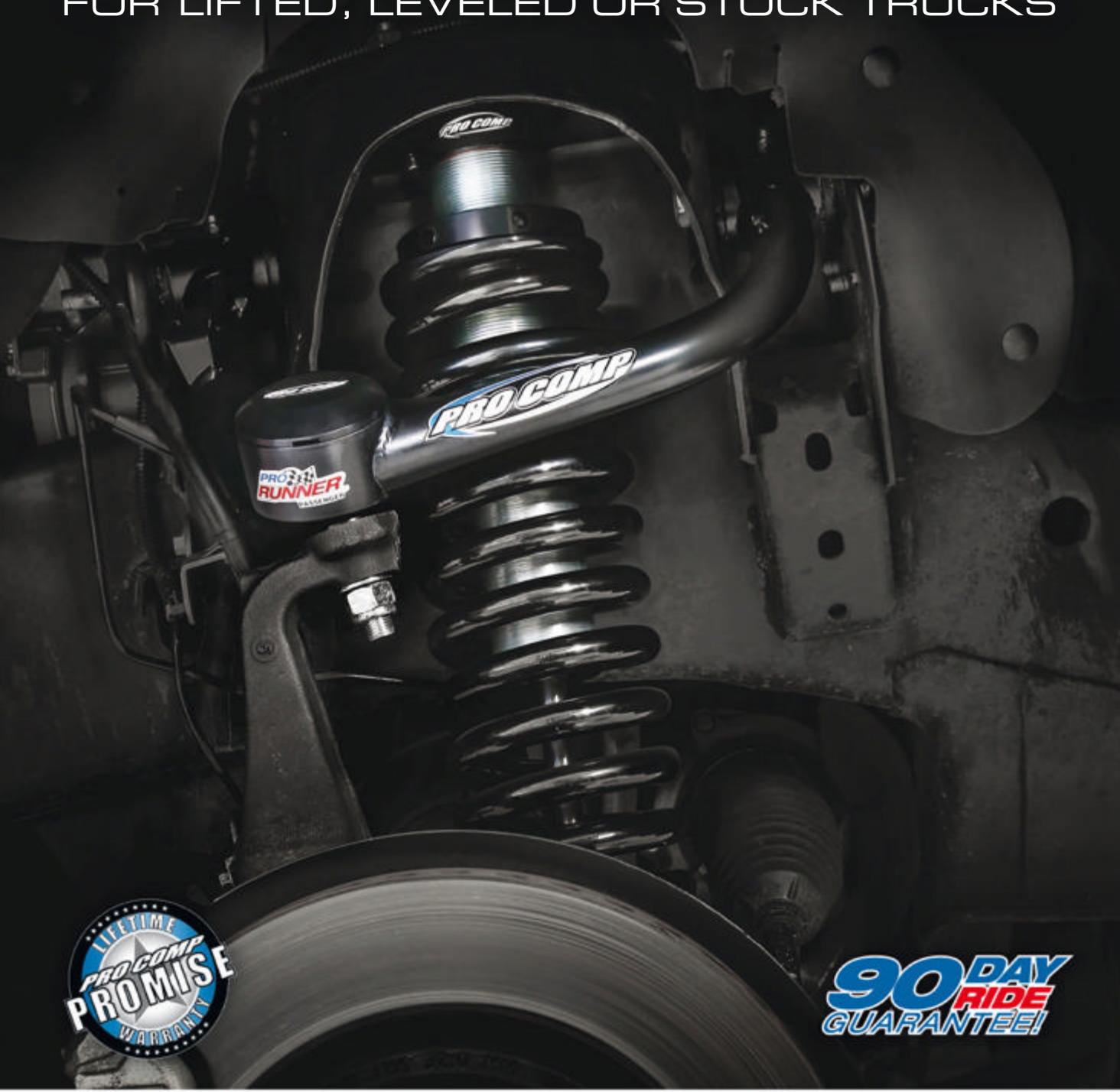
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—STEVE CANNON, CEO MERCEDES-BENZ USA, TO AUTOMOTIVE NEWS. M-B WILL DECIDE BY YEAR'S END WHETHER TO OFFER A PICKUP



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2"	Leveling Kit .....	\$69.95
3"	Body Lift .....	\$374.95
1.5"	Body Lift .....	\$149.95

#### 1999-2006 1500 4WD

6"	4WD Lift w/shocks .....	\$1299.95
3.5" Combo Lift .....	\$249.95	
2"	Lift Kit .....	\$149.95
2"	Torsion Keys .....	\$99.95
3"	Body Lift .....	\$307.95
1.5"	Body Lift .....	\$159.95

#### 1988-1998 1500 4WD

6"	4WD Lift w/shocks .....	\$1195.95
2"	Lift Kit .....	\$149.95
2"	Torsion Keys .....	\$99.95
3"	Body Lift .....	\$176.95

#### 1973-1987 CHEVY 1/2 & 3/4 TON PICKUP

#### 1973-1991 1/2 & 3/4 TON BLAZER, JIMMY, SUBURBAN

6"	4WD Lift w/shocks .....	\$599.95
4"	4WD Lift w/shocks .....	\$499.95

#### 2015/2004-2012 COLORADO/CANYON

2.75" 2015 - Combo Lift Kit .....	\$205.95
3.5" 04-12 - Combo Lift Kit .....	\$349.95
1.5" Body Lift .....	\$165.95
1.5" Leveling Kit .....	\$49.95
2" 04-12 Leveling Kit .....	\$99.95
2" Lift Kit .....	\$149.95

#### 2007-2014 SUBURBAN/TAHOE/YUKON

6.5"	4WD Lift w/shocks .....	\$1739.99
2"	Leveling Kit .....	\$69.95
2"	Body Lift .....	\$319.99

#### 1992-2006 SUBURBAN/TAHOE/YUKON

6"	00-04 4WD Lift w/shocks .....	\$1679.95
2"	92-06 Torsion Bar Keys .....	\$99.95
2"	92-98 Lift Kit .....	\$149.95
3"	Body Lift .....	\$199.95

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#### 1500 4WD

6"	2013-2014 4WD w/shocks .....	\$1519.95
4"	2013-2014 4WD w/shocks .....	\$1409.95
6"	2012 4WD w/shocks .....	\$1519.95
4"	2012 4WD w/shocks .....	\$1409.95
3.5"	12-14 4WD Combo Lift .....	\$659.90
2"	12-14 Adventure Series UCA Kit .....	\$519.95
1.5"	06-14 4WD Body Lift .....	\$139.95
6"	09-11 4WD w/shocks .....	\$1699.95
4"	09-11 4WD w/shocks .....	\$1599.95
4"	09-11 4WD Combo Lift .....	\$735.94
2.5"	09-11 Adventure Series UCA Kit .....	\$595.99
06-11 Heavy Duty UCA Kit .....	\$430.95	

#### 2500/3500 4WD

6.5"	14-15 2500 Radius Arm Kit .....	\$1345.99
6.5"	14-15 2500 Lift Kit .....	\$1449.99
5.5"	14-15 2500 Radius Arm Kit .....	\$1320.87
5.5"	14-15 2500 Lift Kit .....	\$1124.87
4.5"	14-15 2500 Radius Arm Kit .....	\$1159.95
4.5"	14-15 2500 Lift Kit .....	\$975.95
4"	14-15 2500 Radius Arm Kit .....	\$1159.95
4"	14-15 2500 Lift Kit .....	\$975.95
4"	14-15 2500 Body Lift .....	\$975.95
4"	14-15 2500 Leveling Kit .....	\$99.95
5"	02-05 4WD w/shocks .....	\$1195.95
2"	02-05 Lift Kit .....	\$149.95
2"	02-05 Leveling Kit .....	\$99.95

#### 2500/3500 4WD

6.5"	14-15 2500 Radius Arm Kit .....	\$1345.99
6.5"	14-15 2500 Lift Kit .....	\$1449.99
5.5"	14-15 2500 Radius Arm Kit .....	\$1320.87
5.5"	14-15 2500 Lift Kit .....	\$1124.87
4.5"	14-15 2500 Radius Arm Kit .....	\$1159.95
4.5"	14-15 2500 Lift Kit .....	\$975.95
4"	14-15 2500 Radius Arm Kit .....	\$1159.95
4"	14-15 2500 Lift Kit .....	\$975.95
4"	14-15 2500 Body Lift .....	\$975.95
4"	14-15 2500 Leveling Kit .....	\$99.95
5"	02-05 4WD w/shocks .....	\$1195.95
2"	02-05 Lift Kit .....	\$149.95
2"	02-05 Leveling Kit .....	\$99.95

### FORD

#### 05-15 F250 & F350

6"	Radius Arm Kit w/shocks .....	\$1279.95
4"	Radius Arm Kit w/shocks .....	\$1053.48
4"	4WD w/shocks .....	\$799.96
2"	Body Lift (11-15) .....	\$399.95
2"	Leveling Kit .....	\$99.99
1"	Budget Boost .....	\$69.99

#### 99-04 F250 & F350

6"	4WD Lift w/shocks .....	\$995.95
4"	4WD Lift w/shocks .....	\$809.95
2.5"	Levelling Kit .....	\$295.95
1"	Front Shackles .....	\$74.95
3"	Body Lift (99-03) .....	\$334.95

#### 1997-2014 F-150

6"	2014 4WD w/shocks .....	\$1299.95
6"	2014 2WD w/shocks .....	\$1195.95
4"	2014 4WD w/shocks .....	\$1299.95
2"	09-14 Leveling Kit .....	\$99.95
6"	09-13 4WD w/shocks .....	\$1549.95
6"	09-13 2WD w/shocks .....	\$1399.95
2"	09-13 Lift Kit .....	\$169.95
6"	04-08 4WD w/shocks .....	\$1399.95
4"	04-08 4WD w/shocks .....	\$1299.95
2"	04-08 4WD Lift Kit .....	\$169.95
2"	04-08 4WD Leveling Kit .....	\$81.95
3"	04-05 Body Lift .....	\$365.95
6"	97-03 4WD w/shocks .....	\$1295.95
2"	97-03 Lift Kit .....	\$159.95
2"	97-03 4WD Leveling Kit .....	\$99.95
4"	97-03 4WD Combo Lift .....	\$279.95
3"	97-03 Body Lift .....	\$199.95
2"	97-03 Body Lift .....	\$187.95

#### JEEP

#### 07-15 JK LIFTS

2"	Spacer Lift .....	\$129.99
3"	Coil Lift w/ shocks .....	\$439.99
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5"	Coil Lift w/ shocks .....	\$1299.95
2"	Body Lift .....	\$119.99

#### JEEP 84-01 XJ LIFTS

2"	Spacer Lift w/ shocks .....	\$251.46
3"	Coil Lift w/ shocks .....	\$290.66
4.5"	Coil Lift w/ shocks .....	\$495.95
3"	Coil/Rear Leaf w/ shocks .....	\$510.94
4.5"	Coil/Rear Leaf w/ shocks .....	\$749.94

#### JEEP 97-06 TJ LIFTS

2"	Spacer Lift w/ shocks .....	\$229.75
3"	Coil Lift w/ shocks .....	\$459.99
5"	Coil Lift w/ shocks .....	\$529.99
2.5"	Combo Lift .....	\$529.99
1.25"	Body Lift .....	\$94.95
2"	Body Lift .....	\$108.75
3"	Body Lift .....	\$114.22

#### JEEP YJ & CJ LIFTS

1.25"	87-95 YJ Body Lift .....	\$89.95
4"	87-95 YJ Lift w/ shocks .....	\$625.95
2"	87-95 YJ Lift w/ shocks .....	\$499.95
2"	87-95 YJ Body Lift .....	\$89.99
3"	87-95 YJ Body Lift .....	\$95.99
2"	72-86 CJ Body Lift .....	\$89.74
3"	72-86 CJ Body Lift .....	\$94.06

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2"	93-98 ZJ Spacer Lift w/ shocks .....	\$218.62
4"	93-98 ZJ Coil Lift w/ shocks .....	\$639.95
4"	99-04 WJ Coil Lift w/ shocks .....	\$699.95
4"	05-07 WK Lift .....	\$1499.95
4.5"	86-92 Lift Kit .....	\$549.95

#### JEEP COMANCHE MJ

4.5"	86-92 Lift Kit .....	\$549.95
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## 2015 BFGoodrich Outstanding Trails Program

Through July 10, 2015, BFG is taking nominations for its 2015 Outstanding Trails program, which is all about preserving and protecting trails and promoting responsible off-roading and trail maintenance. The tiremaker's judges award grants of \$4,000 to qualified clubs/worthy trails in North America. The Outstanding Trails program turns 10 years old in 2015. To enter your club or learn more, visit [bfgoodrichtires.com](http://bfgoodrichtires.com).



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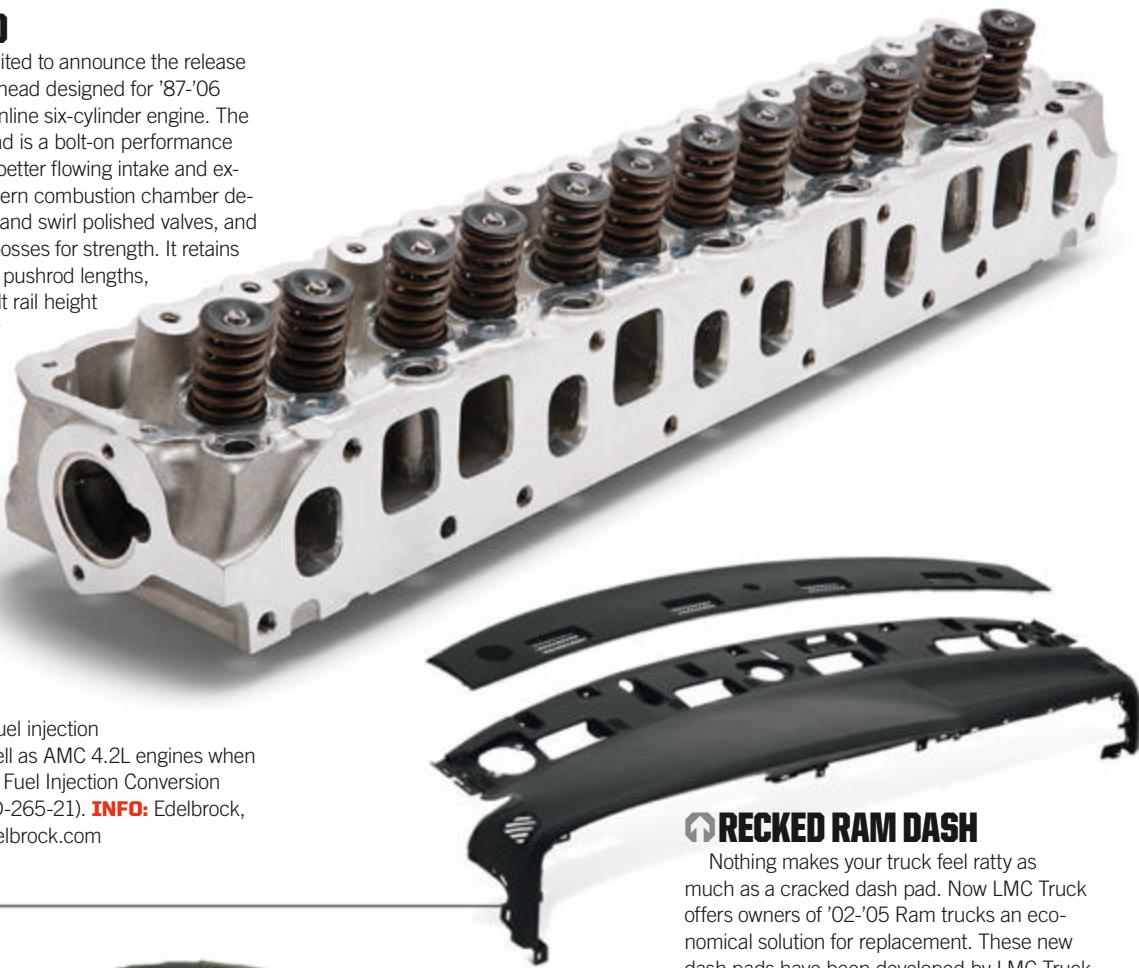
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BY HENRY MUELLER [EDITOR@FOURWHEELER.COM](mailto:EDITOR@FOURWHEELER.COM)

## EDELHEAD

Edelbrock is excited to announce the release of its new cylinder head designed for '87-'06 Jeeps with a 4.0L inline six-cylinder engine. The new Performer head is a bolt-on performance upgrade featuring better flowing intake and exhaust ports, a modern combustion chamber design with back-cut and swirl polished valves, and reinforced rocker bosses for strength. It retains stock valve angles, pushrod lengths, and valve cover bolt rail height for use with factory components. It's machined to accept either distributor or coil pack ignition. Several applications are available to cover the various engine differences, but 50-state emission legality is pending for 4.0L engines when used with factory fuel injection components, as well as AMC 4.2L engines when used with a Mopar Fuel Injection Conversion Kit (E.O. Number D-265-21). **INFO:** Edelbrock, 310/781-2222, [edelbrock.com](http://edelbrock.com)



## RECKED RAM DASH

Nothing makes your truck feel ratty as much as a cracked dash pad. Now LMC Truck offers owners of '02-'05 Ram trucks an economical solution for replacement. These new dash pads have been developed by LMC Truck using improved heat-resistant thermoplastic compounds to resist shrinking and fading. The dash has an ultraviolet inhibitor to prevent damage from sunlight. Dash pads come complete with pre-installed A-pillar seals and color-matched defrost vents and are available in all three original colors. **INFO:** LMC Truck, 800/LMC-TRUCK (800/562-8782), [lmctruck.com](http://lmctruck.com)



## SUPER UP

The new '15 Ford Super Duty is here. Now, it's time to make yours stand out from the crowd. Pro Comp now offers both a 6 and 8-inch suspension systems with coil spring rates specific to diesel and gasoline engines. The 6-inch suspension accommodates 37-inch tires, while the 8-inch kit ups the maximum tire size to 38 inches. Options include nitrogen charged ES9000, adjustable MX-6, or Pro Comp's race-inspired Pro Runner monotube shocks. Both the 6 and 8-inch suspension systems are offered in Stage I, with radius arm drop brackets or Stage II, with all new tubular radius arms. Brake line and bumpstop extensions, drop pitman arms, and Grade 8 hardware are included, making these the most complete suspension systems on the market. **INFO:** Pro Comp, 800/776-0767, [procompusa.com](http://procompusa.com)





## ↑ THERE GOES THE BOOM

Boom Mat has a new premium damping material that is 166 percent thicker than standard damping products. The XL version is an industry-leading 4mm thick to effectively eliminate unwanted vibration, engine, and road noise. Constructed with a 4-mil aluminum panel-stiffening skin with an odorless 4mm-thick butyl noise constraining layer, Boom Mat XL traps unwanted noise while requiring less overall material to get the job done. With the thicker 4mm material, only 25 to 50 percent coverage is required, which reduces weight, installation time, and material cost. Extremely flexible and easy to trim, it can be applied on flat or irregular surfaces such as floorboards, firewalls, door skins, and overhead interior roof panels. A strong adhesion secures the material without risk of sagging or separation. **INFO:** Boom Mat, 800/264-9472, boommat.com

## MORE PULLING POWER PULLER

The More Power Puller, manufactured by the Wyeth-Scott Company, has been something of a staple for a long time now. With a 2 or 3-ton dead-lift capacity out of a product that weighs only 26 pounds, its somewhat compact design makes it a great bring-along for vehicles with the extra cargo space. Straighten bent components, unstuck stuck vehicles, move dead logs blocking the trail, or even remove your buddy's engine when he's sleeping. There's no end to what you can do with a More Power Puller. **INFO:** Wyeth-Scott Company, 800/743-4521, wyeth-scott.com



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<b>Las Vegas Motor Speedway</b> Las Vegas, NV • April 25-26	<b>Charlotte Motor Speedway</b> Concord, NC • July 25-26	<b>Auto Club Speedway</b> Fontana, CA • October 10-11
<b>NCM Raceway</b> Bowling Green, KY • June 6-7	<b>Pikes Peak Int'l Raceway</b> Fountain, CO • August 8-9	<b>Optima Ultimate Street Car Invitational</b> Las Vegas, NV • November 8-9



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Apply cleaner to cool, dry surface.



Scrub with supplied brush.

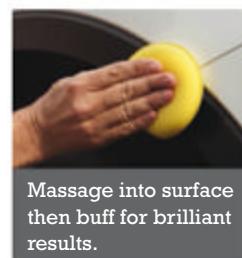


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Massage into surface then buff for brilliant results.



## EASY ENGINE UPGRADE

Do you have a '73-'91 GM 4x4 truck with a blown engine or just want to upgrade to an LS? You'll learn fast that the factory engine crossmember is in the way. That's why Tilden Motorsports developed its '73-'91 GM crossmember kit from 1/4-inch mild steel plate to ensure fit and durability. The crossmember bolts together with no modification needed to the engine mount towers



for an extra-simple install. It comes standard with Grade 8 hardware, and its design allows you to easily service the oil pan just by removing the crossmember. If you are going to swap an LS engine into your '73-'91 GM 4x4 truck, then this kit is a must! **INFO:** Tilden Motorsports, 408/600-0122, [tildenmotorsports.com](http://tildenmotorsports.com).

## FLOGGIN' WRANGLER

Flog Industries has designed a new Jeep JK bumper with emphasis on refinement, style, and enhanced functionality and protection. The Flog bumper has an integrated LightGuard design, stainless steel TIG-welded joints, AntiVibe D-ring mounts, and Frame-Aligned tow-points. Flog pays very close attention to detail when constructing its units. The fairlead is machined from 6061 aluminum, has a hard-anodized finish, and is 1-inch-thick to help reduce stress on high-angle pulls. Available in several styles with or without Bull Bar or LightGuard, each Flog Industries bumper comes with a Lifetime Free-Replacement Guarantee—if it ever breaks, bends, or cracks, the company will send you a new one, no questions asked.

**INFO:** Flog Industries, 435/625-1505, [flogindustries.com](http://flogindustries.com) FW



**T**HE HALLOWEEN MUD BASH IS AN OCTOBER tradition at Barnyard All Terrain, which is located near Livermore, Maine. Saunter into the 120-acre facility during the Bash and you'll see scores of 4x4s of all sizes and modification levels intermingled with a number of people in costume.

What is Barnyard All Terrain? Well, it's a mud-oriented facility nestled in the rolling countryside of rural Maine and is surrounded by farmland and woods. As a matter of fact, the property used to be farm, hence the name. Barnyard materialized in 2007 due to the popularity of mud racing in the area. Barnyard All Terrain President Dave Lovewell says that racing used to be held in the farm's cornfield on Sunday afternoons. Incidentally, the farm has been in the Lovewell family since the late 1700s. Soon, the racing got so big that they decided to create a track. From there, things

took off. Nowadays, Barnyard features a Hill 'n Hole track, single-lane high-speed track, two-lane deep-mud track, 5-foot-deep Bounty Hole, and more. In addition to the tracks, the facility has a large camping area, available food, 4x4 wash-down capabilities, and more. It's also laid out in such a way that spectators can see all the racing from one convenient location. Throughout the year, Barnyard hosts approximately four big events. For 2015, the list includes a Throttle King Qualifier, a 4th of July weekend event called Firecracker 4x4, a Trucks Gone Wild event, and of course the aforementioned Halloween Mud Bash. Dave is into it. "I love the sport. I love the people that participate in the sport," he says.

When we walked into Barnyard on the first day of the two-day Halloween Mud Bash, we were almost immediately complimented on our Halloween costume. That was interest-

ing because we weren't in costume. Folks in Maine have a sense of humor. It must be the defense mechanism to handle the long winters. And speaking of long winters, mud racing ain't happening in the winter months, which is the direct opposite to, say, the Southeast, which spools up mud activities in the wintertime due to the cooler temperatures. It's during the long winter when folks in the extreme Northeast use their time wisely and get some serious wrenching done on their rigs. And for some, the length of winter gives them time to create some amazing custom rigs. During our time at the Halloween Mud Bash, one of things that we thought was cool was the wide variety of rigs. There were a number of daily drivers, but there was also a number of rockin' heavily modified rigs, including mega trucks. Yes, there are mega trucks in Maine. It's not just a Southeast thing.

If you're looking for a unique event that's populated by friendly people and scores of cool 4x4s, check out the Halloween Mud Bash or any of the events at Barnyard All Terrain. More info can be found at barnyard-allterrain.com.

## Slingin' mud in Maine

By Ken Brubaker ken.brubaker@fourwheeler.com Photography: Ken Brubaker

# HALLOWEEN





2

**1.** The 5-foot-deep Bounty Hole was like a magnet for the biggest rigs, and they were drawn to it. Unfortunately, the Bounty Holes mud was like a magnet that latched onto 'em and stopped most of them in their tracks.

**2.** Ron Pike obviously loves to mud race, and we don't think his "Angry Pumpkin" Jeep's engine was ever turned off long enough to cool. Here he is getting wild during the deep-mud racing on Saturday.

**3.** Saturday's deep mud racing seemed to be the most popular at the Halloween Mud Bash judging by the number of rigs. It consisted of seven classes of competition, and it was cool to see licensed, daily driver/trail rigs like this Land Cruiser slinging mud.

**4.** October in Maine can be a tad frosty, and it was exactly that at the Halloween Mud Bash. It was cold enough for morning frost, but the mud didn't freeze. A warming fire greeted racers at check-in.

**5.** Sean Poulin's rear-engine 496ci-powered rig was all fired up as it attempted to exit the Bounty Hole.

**6.** It was interesting to walk through the pits and check out the tech. The owner of this Ranger did what many mud-runners do and mounted the radiator in the bed of his truck to eliminate clogging.

**7.** Go-fast mud rigs were tearing it up during Saturday's deep mud racing.

# MUD BASH



3



5



4



6



7



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8



9



10



11

**8.** If you like to pitch your 4x4 in mud, the Barnyard has you covered. If not, there's plenty of room in the spectator area to sit comfortably and watch other folks get their 4x4 muddy.

**9.** There were four classes of Hill 'n Hole racing on Sunday. This fast, popular, straight-line racing contained more jumps than mud.

**10.** Neal Gagne owns Top Notch Fabrication in Lewiston, Maine, and his '86 Chevy 1500-based rig sports a 505ci engine, Dr. Steve's Transmission Clinic-built TH400, SCS T-case, Detroit-locked high-pinion Dana 60 front axle, spooled 14-bolt rear axle, triangulated four-link suspension with FOA coilovers, hydraulic steering, and modified BKT 12.4x24 tires. The rig is seen here in action in the Hill 'n Hole competition. Look for a feature on this rig soon at [fourwheeler.com](http://fourwheeler.com).

**11.** Peter Gund's homegrown rig is named, well, Home Grown. It's packed with a 548ci V-8, TH400 transmission, NP205 T-case, 2½-ton Rockwells, four-link suspension, Overtime CNC Performance shocks, and modified 14.9x24 BKT tires. We'll have a feature on this interesting rig soon at [fourwheeler.com](http://fourwheeler.com). FW

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# FIRST HIGH

## Buying Your First Lift Kit

By John Cappa editor@fourwheeler.com Photography: John Cappa and Courtesy of the Manufacturers



If you've ever wondered what the best lift kit for your 4x4 was, you're not alone. One of the more common questions we receive involves choosing the best aftermarket suspension for a specific 4x4. Unfortunately, the answer isn't as easy as loading a silver bullet into a revolver. There are many things to consider when choosing a suspension lift, especially if it's your very first. Always keep in mind that what may work for someone else, may not work for you. Driving style, personal preference, and the kind of off-roading you plan to do will dictate what lift kit will fit your needs best.

There are usually two kinds of first-time lift kit buyers: those that want to spend as little as possible and those that jump in with both feet and buy more suspension than they may ever need. As you can imagine, neither practice is ideal. The low-buck buyer often tries to piece together a lift with spacers and other random suspension components. For an inexperienced enthusiast, the result can be a poor-performing system that ends up costing more than a conventional complete kit available from any number of manufacturers. On the other side of the coin, if you spend umpteen thousands of dollars on an off-road-specific suspension, you may find that it can be a handful on-road or while towing a trailer.

Choosing a lift kit requires some compromises. You have to be honest about what is really important to you. If a soft ride and slow speed trails are your thing, look for a lift with low spring rates and soft-valved shocks. If you load down your 4x4 with gear, like to carve corners on the street, or you regularly tow a heavy trailer, you'll want firmer springs and shocks. For all-out high-speed desert two-track, you'll want to look for a lift that provides increased wheel travel and comes with monotube-style or maybe even bypass shocks. Many higher-end lift kits give you a few shock upgrade options to choose from. Here are some lift basics that should set you in the right direction to purchase your first lift kit.

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Large drop-down bracket IFS lifts like this Ford F-150 kit from Full Throttle Suspension ([ftskits.com](http://ftskits.com)) are extremely common. They are generally reserved for the light off-road and street crowd. Drop-down lifts, combined with overly abusive off-road driving and big tires, can result in steering or front axle failure. Dropping the suspension components down provides the lift needed to clear larger tires, but it does little to strengthen the overall frontend assembly.



Coil spacers such as these from Daystar ([daystarweb.com](http://daystarweb.com)) are an easy way to put a budget boost on your late-model solid-axle Jeep. If you install spacers that are larger than 2 inches or so, you should also upgrade to longer shocks. Spacer lifts should be limited to less than 3 inches. Never stack spacers for more lift.



Spacer leveling kits for midsized and fullsize IFS 4x4s have become increasingly popular. This BDS ([bds-suspension.com](http://bds-suspension.com)) basic spacer leveling kit fits '09-'14 Ford F-150s. Leveling kits generally come in one of two types. The basic spacers are significantly less expensive than an upgraded coilover shock. However, there is virtually no suspension performance difference between the many basic spacer lifts available and a stock suspension system, so trying to pick the best one is a moot point. All of these spacer kits simply provide a small amount of lift.



Increasing the wheel travel of your IFS 4x4 allows you to traverse rough terrain at higher speeds. Bolt-on long-travel lifts like this Pro Comp ([procompusa.com](http://procompusa.com)) Pro Runner kit for the '07-'15 Toyota Tundra include new wider upper and lower control arms and coilover shocks with reservoirs. The kit provides 4 inches of lift, increases front wheel travel to 14 inches, and widens the track width of the truck by 5 inches. Wider aftermarket fenders are required for full tire clearance and coverage.



IFS leveling kits that utilize a replacement coilover shock, like this ARB ([arbusa.com](http://arbusa.com)) Old Man Emu BP-51, provide more shock damping and adjustability. In most cases, the coilovers can be micro-adjusted to the desired amount of lift. You'll realize a significant performance improvement off-road with aftermarket coilovers like this.

Owners of IFS 4x4s with torsion bar suspension systems can gain up to 2½ inches of lift up front with aftermarket torsion keys. These Zone Off Road Products ([zoneoffroad.com](http://zoneoffroad.com)) torsion bar keys level the stance of '11-'15 GM 2500HD and 3500HD trucks. It's a good idea to upgrade the shocks at the time of installation.



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▀ Tacky '80s show-truck multi-shock hoops have been replaced by functional bypass/coilover suspensions like this EVO Manufacturing ([evomfg.com](http://evomfg.com)) Double ThrowDown kit for the '07-current Jeep JK Wrangler. The bypass shocks allow the user to adjust the valving for a smooth on-road ride or more firm for better performance at speed off-road.



▀ Older vehicles usually require longer brake line installation to accompany the lifted suspension, which may or may not come in your lift kit. Lifts for newer 4x4s often come with brake line drop brackets. This makes at-home installation significantly easier because you don't need to crack open the brake lines and bleed the system.

▀ Some lift kits don't include everything you need to complete a sound, streetable install. It's very common for steering and driveline modifications to not be included with your lift kit. For example, many short-wheelbase Jeeps require a slip-yoke eliminator kit and a CV-style driveshaft to eradicate the driveline vibration caused by a lifted suspension. Always ask the manufacturer what other components are recommended before settling on a suspension system and tearing your 4x4 apart in the driveway.



▀ Leaf-spring and coil-spring lift kits are commonly available with heavy-duty or soft-riding springs. If you regularly carry excessive loads or have performed a heavy engine swap, you should steer into the stiffer springs. When working with a leaf-spring suspension like this Skyjacker ([skyjacker.com](http://skyjacker.com)) lift for a '74-'87 Jeep FSJ, always plan on replacing the U-bolts. In many cases they are so corroded that they have to be cut off the vehicle to be removed.



▀ Custom-fabricated long-travel IFS 4x4 lifts can provide between 13 and 17 inches of reliable wheel travel. This Ford F-150 at JD Fabrication ([jdfabrication.com](http://jdfabrication.com)) required extensive modifications to the inner wheelwells and other areas to allow the suspension to fully compress without the tires rubbing. The wheel travel and track width are increased via all-new wider upper and lower control arms and spindles. Adjustable high-end bypass and coilover shocks control the suspension movement, and hydraulic bumpstops take the bite out of harsh bottoming when hitting big bumps at speed. FW

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# Part 1: Adding a steady foot with new suspension, wheels, & tires

By Jerrod Jones editor@fourwheeler.com Photography: Jerrod Jones

**W**HEN OUR NEWEST '14 WRANGLER Unlimited Rubicon project entered the *Four Wheeler* family wearing Anvil Grey paint, we weren't about to name it "Pinky." Anvils are big, heavy, and basically unbreakable. They're meant to take a beating—literally. They're the type of thing that gets passed down from father to son after years of being pounded against and never really destroyed. They might acquire some nicks and dings over time, but nothing that will keep them from doing their job. The plan behind the Anvil is to outfit it with the most durable, proven parts we can, while keeping all the luxury that comes in a new Rubicon

Wrangler and only improving the comfort and ability of this do-all family go-getter.

All anvils need a big, steady foot to make sure they stay in place, and subsequently we decided to start at the feet of our Anvil, outfitting our brand-new Rubicon Wrangler with 35-inch Toyo Open Country MTs on AEV Pintler wheels. To make sure the new wheel and tire package fit without any cutting, we needed to lift it but only a couple inches. And if we're going to be replacing stock suspension parts, then we're going to get the most bombproof replacements we can. With solid-stock control arms and heavy-duty everything else, the Rock Krawler 2.5 X-

Factor Stage 1 mid-arm suspension system was the perfect choice. It not only keeps our JK low, but it also improves the ride and adds stronger parts. Since this is a high-end build, we enlisted the Jeep specialists at Jeeps R Us in Laguna Beach, California, to handle the work. With every kind of Jeep passing through its doors, it was an easy choice as to which shop we entrusted to assemble our bolt-together Jeep properly.

With a natural first step of lift and tires installed at Jeeps R Us, our Jeep build is well underway. Check back for Part 2 of our project where the upgrades start coming fast and feverously.



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**1.** Brand new tires, wheels, stock suspension—all gone. Jeeps R Us put our JK on a lift and stripped it down. First, all four wheels and tires were pulled, and then each corner was addressed separately, not completely removing everything at once so we only had to support and work on one corner at a time. Since this kit uses factory control arm mounting points and has new coil springs that aren't that much taller than stock, installing the new parts is just that much easier.

**2.** The front part of the Rock Krawler 2.5 X-Factor Stage 1 Wrangler suspension includes four factory-replacement heavy-duty control arms, track bar, long-travel multi-rate coil springs (triple-rate, actually), sway bar links (the ones pictured are actually for the rear), brake lines, bumpstop extensions, and 2.0 RRD shocks. Going with a Stage 2 kit gets you remote-reservoir RRD shocks, but for our build the 2.0 RRD shocks offer all the performance we need. They're really nice units.

**3.** Rock Krawler's 2.5 X-Factor Stage 1 rear section also includes four control arms, a heavy-duty track bar, multi-rate coil springs, sway bar links (the ones pictured are actually for the front), bumpstop exten-

sions, and 2.0 RRD shocks. To keep all angles and geometry perfect, the rear also comes with angled spring shims and a track bar relocation bracket.

**4.** Rock Krawler's control arm ends are either a Krawler joint with high-misalignment balls, or a poly-blend bushing. The rear control arms are designed to move the rear axle rearward 1 inch, plus all eight control arms are adjustable in length to set the appropriate caster, depending on how much lift you have. If you start with a 2½-inch lift spring and go up to 4½ inches of lift, you'll be able to adjust the arms accordingly.

**5.** Bumpstop extensions are included to account for the 2½ inches of lift on our JK Wrangler project. You'll have to drill out the hole in the spring pad in order to slip in the supplied bumpstop extension bolt.

**6.** Long-travel, multi-rate coil springs are included for all four corners. At 2½ inches taller than stock, there is a minimal change in center of gravity, and the variable spring rate is matched to the included nitrogen-charged shocks. It's a very controlled, nice-riding system that we're highly impressed with.



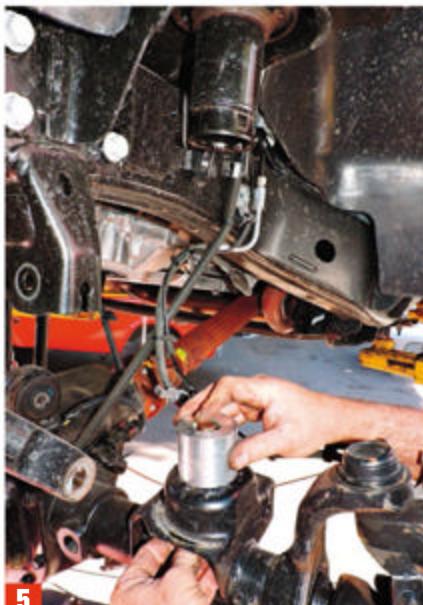
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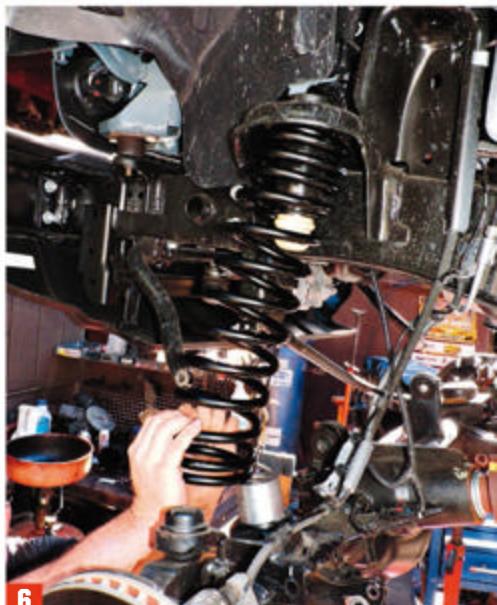
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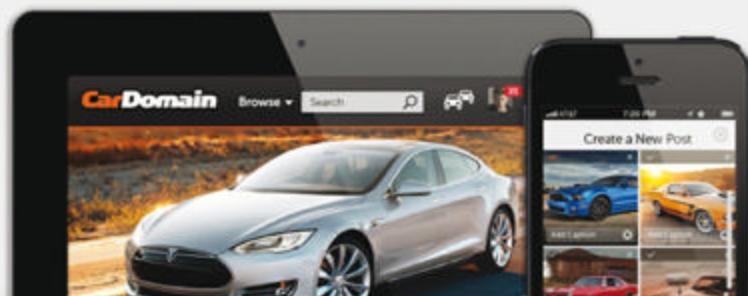
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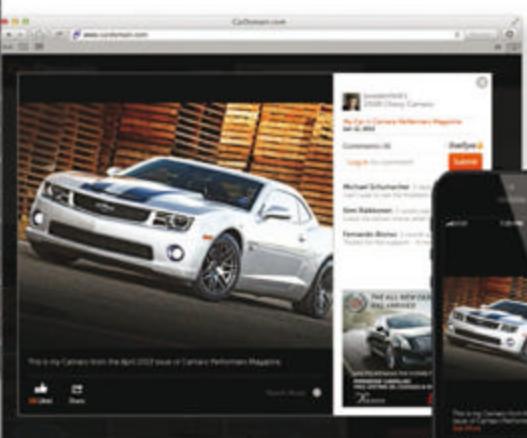


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7



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7. The 1½-inch solid-steel upper control arms bolt directly in place of the factory units. The instructions dictate adjusting the arms to 19½ inches between mounting eyes for the 2½-inch suspension.

8. The lower front control arms are made from 1.625-inch solid steel, and also bolt directly in place of the factory control arms. They are angled for high clearance in uneven terrain. They need to be adjusted to 23½ inches for the 2½-inch suspension.

9. The track bar uses a large Heim joint at the axle side and a poly blend bushing Flex joint at the other end. It is completely adjustable for varying lift heights, but for a 2½-inch kit, it'll need to be 32½ inches.

10. Adjustable sway bar links are supplied for the front and rear of the vehicle. If you have a Rubicon Wrangler with a disconnecting sway bar, then you don't need the disconnect links.

11. Nitrogen-charged 2.0 RRD shocks are supplied with the 2.5 X-Factor system. They're specified for the JK Wrangler with the correct ends to mount in the factory locations. No hokey adapters that can come loose and fail in the field. Overall, we were very pleased with the thoughtful engineering put into the Rock Krawler system.

12. A completed frontend kit from Rock Krawler should look like this. There is more suspension dropout thanks to the slightly longer shocks. Make sure to adjust the sway bar links so that they don't fold the wrong way upon compression after full suspension extension.

13. When you lift the rear of a JK, the spring pad becomes slightly angled as the pinion is rotated up for driveshaft angles. Rock Krawler supplies lower shims to keep the rear coil springs sitting correctly on their buckets and prevent the springs from bowing.



8



9



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12



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14

**14.** The rear bumpstop extensions are elevated and pushed forward to properly meet the bumpstops when compressing the newly lifted suspension.

**15.** A track bar relocation bracket realigns the track bar to keep the correct geometry. Even at 2½ inches of lift, Rock Krawler knows that the adjustment needs to be made. An included sleeve is slipped in place of the original track bar so the factory axle bracket doesn't crush when you tighten down the bolt to hold the relocation bracket.



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**16.** The rear coil springs are long-travel, multi-rate units just like the front. The coil wind is smaller than the factory coils through the middle but the same on the ends so it fits just like a stock coil spring would. The tighter wind in the middle allows coil-to-track bar clearance even with the rear axle an inch further back.

**17.** The rear upper control arms for a 2½-inch kit on a four-door JK need to be adjusted to 18⅞ inches. The lower arms need to be adjusted to 21⅛ inches. These measurements are slightly different for a two-door JK.

**18.** With most of the rear kit finished, we buttoned up the last few parts, including the rear Rock Krawler 2.0 RRD shocks and the completely adjustable track bar, made from 1½-inch solid steel.

**19.** With a top-tier build such as this, we weren't about to skimp on tires and wheels. The 17x8.5 AEV Pintler wheels are specifically designed the JK Wrangler and fit like a glove. We brought our wheels and 35x12.50R17 Toyo Open Country MT tires to our local Discount Tire to be mounted and balanced. We'll cover the wheels and tires in more detail in the next installment. Larry Garcia at Jeeps R Us hefted all four into place and our ride was done

**20.** Rock Krawler includes new longer stainless steel braided brake lines with the X Factor suspension, so we dutifully installed them. Here's the completed rearend of our Project Anvil JK Wrangler. FW

## SOURCES

**AEV Conversions**  
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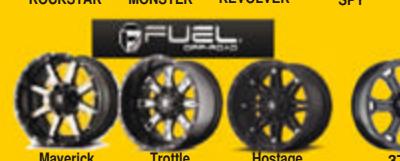
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# ROUND SPRING SWAP

## Removing the torsion bars from a '99-'06 GM truck

By John Cappa editor@fourwheeler.com Photography: John Cappa



If you have a lifted '99-'06 GM 4x4, you've had to futz with torsion bars. In a stock application, the torsion bars work OK, but they add a lot of complexity and weight to your suspension system. When you add a lift kit, the required drop brackets generally hang down far below the frame, significantly decreasing ground clearance. JD Fabrication in Escondido, California, went to work on the GM IFS to come up with an affordable mid-travel steering and suspension solution. The company developed a simple weld-on coilover kit that replaces the clunky torsion bars and related crossmember bracketry. JD Fabrication specializes in go-fast long-travel suspensions for 2x4s and 4x4s. The company already offers a complete high-end long-travel IFS kit for the '99-'06 GM 4x4 that provides up to 15 inches of wheeltravel. The new coilover kit increases wheeltravel to 11 inches. The kit also provides the performance and easy ride-height adjustability of a 2½-inch-diameter King coilover shock with a remote reservoir. Here's how it all comes together.



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1



2



4



3



5



7



6

**1.** The JD Fabrication kit includes 2½-inch-diameter, 10-inch-travel King coilover shocks, 700-in-lb coils, and custom shock ends that fit the factory GM lower A-arm. The truck height can be adjusted via the coil adjusting hardware.

**2.** Factory upper A-arms are replaced with heavy-duty 1.5-inch, 0.120-wall 4130 chromoly JD Fabrication arms. These feature ¼-inch rod ends and 1-inch uniballs in place of the wear-prone rubber bushings and upper ball joints.

**3.** This truck has a 6-inch suspension lift. The JD coilover kit is available for '99-'06 GM 4x4s from stock height to any amount of lift. Removing the torsion bars and related lift bracketry increased ground clearance under the frame of our truck by almost 5 inches.

**4.** The rubber shock bushings in the lower A-arms are replaced with uniballs pressed into aluminum adapters. A  $1\frac{7}{16}$  drill bit and  $\frac{1}{16}$ -24 tap are needed to drill and tap the holes for the set screws that keep the assemblies in place.

**5.** The factory upper shock mounts need to be removed from the frame. A grinder, torch, or plasma cutter can be used. Be careful when cutting in this area—there are several brake lines and wires nearby.

**6.** JD Fabrication supplies heavy-duty tie rods (top) to replace the tiny, failure-prone stock GM components (bottom). The JD Fabrication tie rods are made from 1.25-inch, 0.120-wall 4130 chromoly and feature quality ¼-inch rod ends with stainless steel misalignment spacers and Grade 8 or better hardware.

**7.** The tie-rod end holes need to be reamed out to  $\frac{5}{8}$ -inch, and the upper A-arm ball joint holes need to be reamed out to  $\frac{3}{4}$ -inch to accommodate the larger hardware.

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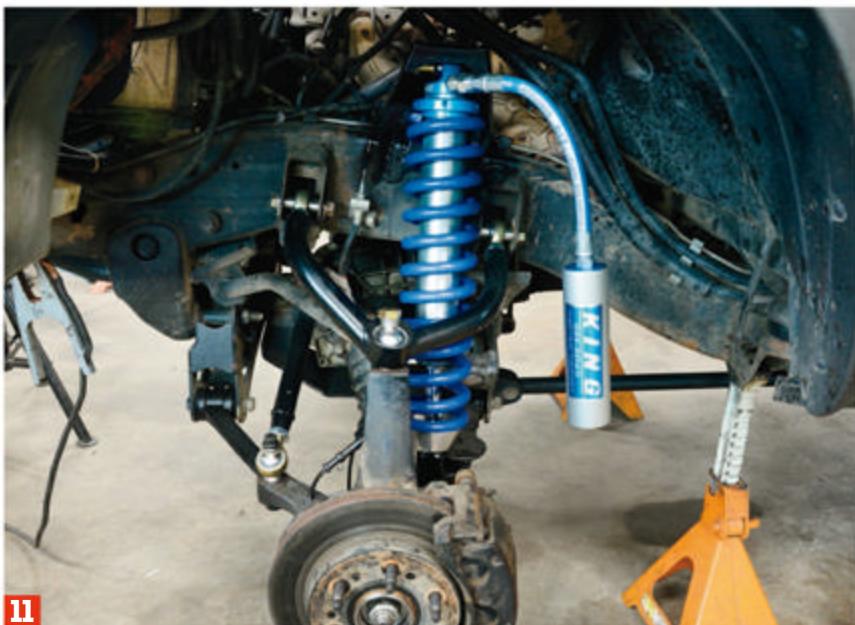
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8



11



9



12



10

**8.** Problematic stock upper A-arm alignment hardware is replaced with lockout spacers. The A-arm alignment is now set via the  $\frac{3}{4}$ -inch rod ends in the new upper A-arms.

**9.** Once the JD Fabrication upper shock mounts are tack-welded into place, you can mock up the coilovers to check for clearance. When everything looks good, you can fully weld the mounts to the frame. Clean off all paint and oil prior to welding or you'll end up with a weak contaminated weld.

**10.** More wheel travel than stock is afforded by the new JD Fabrication steering bits and upper A-arms without going beyond the capabilities of the stock CV halfshafts.

**11.** The  $2\frac{1}{2}$ -inch King coilovers bolt into the new lower shock bearings and upper mounts. The reservoirs are then attached to the frame.

**12.** A removable crossbrace is installed over the engine and connects the two upper shock mounts together for more reinforcement. The crossbrace mounting tabs need to be welded to the shock mounts once clearances have been checked around the engine. **FW**

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# BUG-OUT BLAZER

## Part 4: Strapping on B.O.B.'s performance-leaf suspension

By Ben Battles editor@fourwheeler.com Photography: Ben Battles

**W**HENEVER WE THINK "LEAF SPRING," we can't help but picture a crusty-old cowboy with wrinkled, leathery skin grinning out of the side of his mouth like he knows something everyone else doesn't, while at the same time symbolically giving a one-fingered salute aimed at today's technology. In fact, if we ever decide to get a tattoo, this guy is on the short list to get inked on the arm.

Within the scope of dated, but still very relevant automotive technology, we don't think we're too far out of line drawing comparisons between the leaf spring and one of John Moses Browning's most shining achievements—the 1911 model .45-ACP semi-auto pistol. The latter was, undoubtedly, a more-challenging



Parts that represent the highest evolution of old, but proven and effective technology, has been the theme with B.O.B all along. Case in point: the ORD Custom Leaf Springs. They're about as close as you can get to a cutting-edge coilover, multi-link suspension technology while still maintaining the brute-force simplicity and reliability of a leaf spring. Custom built to your specs, these things are reported to provide massive amounts of wheel travel, which we'll soon find out when B.O.B.'s rolling under its own power again.

engineering feat, but mechanical dissimilarities aside, the current mindset on each product has clear parallels. In today's world of long-travel, multi-link coilover suspension systems

and whiz-bang, striker-fired handgun options, both the leaf springs and 1911 are viewed as antiquated technology by today's standards. While showing their age (much like the previously mentioned grizzled-up cowboy), this doesn't change the fact that both leaf springs and the 1911 can still be brutally effective at their respective job titles. And with a little fine-tuning, they can even be the best tools for the job. That's commonly referred to as "standing the test of time."

If you've been following along with the B.O.B. build, you're fully aware by now that every part that gets bolted, welded, or otherwise affixed to our end-of-the-world, Bug-out Blazer needs to exhibit higher-than-normal levels of reliability, effectiveness and "field-fixable" simplicity. After all, we're depending on B.O.B. to get us out of, in to, or around harm's way without fail should we all find ourselves in a state of turmoil and civil unrest. Accordingly, B.O.B. is a back-to-basics type of build—one that reaches a level of reliability and bulletproofness that a multi-link coil-sprung, electronics-strewn, plastic-clad

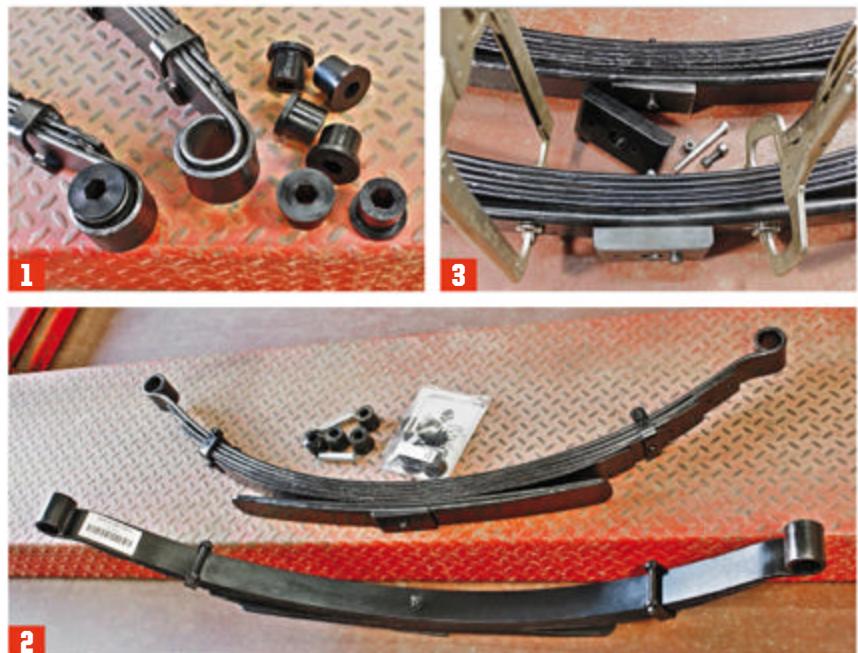


rig could only dream of. In the suspension world, the leaf spring is the poster child for dead-reliable, hooked-on-phonics-simple and .50-BMG-effective componentry, and that's exactly what we're focusing on here.

One of the draws to pre-'91 K5 Blazers, Suburbans, and K-series trucks for this type of build is their easily modified and swapped-out solid-axles strapped to a simplistic leaf-spring suspension system. It really doesn't get any simpler, actually. Not only do leaf springs serve as the shock absorbing connection between axles and frame, but they also locate the axle housings front to rear and side to side, completely negating the need for control arms and track bars. In this case, the simplicity in operation also lends itself to simplicity of modification—no need to be a wizard behind the wrench or welder to modify the suspension on a leaf-spring-equipped rig. Even a complete front wheel alignment can be done in your driveway with a tape measure and a piece of chalk after you've lifted it.

On a basic level, the plan with B.O.B.'s suspension was to gain enough altitude to clear the way for the 40-inch Toyo Open Country M/T's you'll see in the next installment and to do it without butchering the sheetmetal beyond recognition or throwing the inner fenders to the wind. A modest 6 inches of lift was the number we settled on, and using prior experience as a guide, we should be able to get away with some strategic trimming and precise bumpstop lengths to make it all work.

If you're tackling a similar build on vintage GM iron, there's one thing we're pretty sure of: Offroad Design (ORD) will prove an indispensable resource for both parts and experience. Stephen Watson and the ORD crew have thrashed on their K-series rigs across some of the gnarliest trails in the country—they know what works, what breaks and the best parts to throw at your rig based on your own unique requirements. Such is the case with



the Offroad Design Custom Leaf Springs we just finished strapping to the front of B.O.B. Available in lift heights from 2 to 7 inches, these springs are custom-built to your truck's requirements to maximize wheel travel and maintain the best ride quality possible based off of the amount of weight you'll be hanging off it. Think of them as the leaf-spring equivalent to a fully adjustable coilover shock.

Instead of using a few thick leaves like a typical lift spring, our new ORD springs use a total of 10 thinner leaves, all wearing anti-friction pads at their outer ends. Adding leaves to the pack while making them thinner is a recipe for a more-compliant compression stroke, increased articulation, and increased wheel travel. In fact, ORD claims 50 percent more wheel travel from its custom spring packs as compared to a standard lift spring—

**1.** Employing a "one is none and two is one" philosophy, double military-wrap main eyes on the ORD springs represent a welcomed failsafe for B.O.B.—If one main-leaf happens to break, you still have a backup in place to keep the spring pack functioning. Spring-tip pads on all lower leafs provide friction-free movement and help facilitate bind-free suspension action. To finish our spring packs off, we paired them with greasable poly bushings for a durable and stable frame connection.

**2.** Our K5 will be playing pack mule for multiple occupants, so load-carrying capacity trumps gobs of wheel travel out back. For a solid foundation, a pair 4-inch BDS lift springs got the nod for the key ingredient in B.O.B.'s multi-pronged rear suspension plan. They come complete with poly bushings and a no-questions-asked lifetime warranty. It's nice to know BDS won't have a problem with damage from a nuclear blast, I.E.D. explosion, the after-effects of a super volcano, or being covered in zombie guts.

**3.** The second part of our rear suspension plan involved replacing the degree shims that came on our BDS springs with a set of ORD 1-inch Zero Rates. The Zero Rates do nothing to change spring rate (hence the "zero-rate"), and since they get bolted in through the centerpin just like an additional leaf (with the leaves clamped together to keep them from separating), they're not blocks either. What they are, however, is awesomely convenient. We knew B.O.B. would need a little extra lift in the rear compared to the front, as well as a slight axle shift towards the rear of the wheelwell. The Zero Rates let us do both.

**4.** Need clearance for bigger tires but don't want to replace perfectly good leaf springs? Want more lift without sacrificing spring rate? B.O.B. needed the latter, and the ORD Shackle Flip Kit was the perfect solution. The Shackle Flip brackets can be had in either 2½ (shown) or 4-inch-lift flavors and replace the stock stamped rear-spring hangers with much-more-rugged ¼-inch welded plate-steel brackets. We also scrapped the stamped factory shackles in favor of 4½-inch ORD HD Super Shackles, poly bushings, and greasable bolts for a bulletproof rear-spring hinge point.



a claim we'll be putting to the test when B.O.B. is rolling under his own power again. Along with custom lift heights, ORD can build these to custom lengths, as well as with offset center pins to fine-tune axle location within the wheel well. These rigs come from the factory with the front tires biased towards the rear of the wheel opening, so to compensate and make final tire fitment that much easier, we had ORD move our center pin locations forward by an inch. To top off the front install we matched the ORD springs with a set of  $\frac{3}{8}$ -inch-thick ORD Heavy Duty Shackles (to replace the weak factory stamped-steel shackles and inadequate, small-diameter upper bolt) and a full complement of poly bushings and greasable spring-eye and shackle bolts all around.

Out back we took a multi-pronged approach, with BDS 4-inch lift springs, an ORD  $2\frac{1}{2}$ -inch shackle reversal kit, and ORD 1-inch Zero Rate add-a-leaves. The K5 Blazers sit low in the rear from the factory, and add to this a 40-inch spare tire and a yet-to-be-determined amount of camping, recovery, and defensive gear, the extra bit of rear lift should

help level B.O.B. out when all is said and done. Running a 4-inch spring/shackle-flip combo (instead of a straight-up 6-inch-plus lift spring) will also help keep suspension action and ride quality in check.

Unlike the front, we weren't as concerned with wheel travel as we were load-carrying capacity, but still needed a proven, well-built spring pack that we could count on to take abuse and keep on smiling (literally). Because we've had great luck with them in the past—as well as the fact that they come with a no-questions-asked, "No B.S. Hardcore Lifetime Warranty" (not that this will matter during the zombie apocalypse, but it's nice to know)—the BDS "Glide-Ride" spring packs and included urethane bushings represented a solid option. These springs come with a degree shim installed to adjust for pinion angle, but since we'll be welding new spring perches onto the 14-bolt's tubes anyway, we'll

**5.** Replacing both suspension and axles in one shot has its benefits; namely, you can unbolt the entire shebang and roll it out from underneath like a wheelbarrow in lickety-split-like fashion. Since the previous owner replaced all the common wear-

components both front and rear shortly before the title was signed over to us, the factory stuff was in tip-top shape and definitely worth something to somebody.

**6.** With the new front suspension hanging (which took all of about 10-minutes) here's a look at our new ORD Heavy Duty Front Shackles we swapped in-place of the weak factory pieces. The HD shackles are a two-fold strength upgrade: you get beefier,  $\frac{3}{8}$ -inch thick side plates, and secondly, new poly bushings that accept a larger,  $\frac{1}{2}$ -inch-diameter greasable bolt versus the factory  $\frac{7}{16}$ -inch bolt. For '88-'91 K5s like B.O.B. (including Suburbans and 1-ton trucks), the HD shackles are the exact same length as your factory shackles. For pre-'88 rigs, they're a  $\frac{1}{2}$ -inch longer, which really doesn't have a measurable consequence one way or the other when using stock-length springs.

**7, 8.** Before we could mount the ORD Shackle Flip brackets, we needed to liberate the factory stamped hangers from the framerrals. These are held in place with six large steel rivets per side, the heads of which need to be shaved off to pop them free from the frame. We tackled this two different ways to see which tactic was more time-efficient: burn 'em off with a torch or cut a slice in the head and shear them off with an air chisel. The torch won. You could also grind them off or drill them out if those were the tools you had. Just make sure you don't have any fuel leaks if you're taking the torch route!

**9.** In retrospect, it would've been a whole lot easier just to bite the bullet and lower the fuel tank (if even just a little bit), but in the end we were able to snake the nuts around the backside of the frame and bolt our new ORD Shackle Flip Brackets in place without touching the tank. Since the shackles are now pointed down instead of up, they're vulnerable to rock damage, but since we replaced the weak factory shackles with ORD's  $\frac{1}{2}$ -inch-thick steel HD Super Shackles, there's no reason to lose sleep over it. Greasable bolts will keep the poly bushings squeak-free and ensure smooth suspension action.



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be able to dial in pinion angle when we burn 'em home. To replace the unneeded shim, we mated a set of ORD 1-inch Zero Rate add-a-leaves to our BDS spring packs (which get bolted in directly through the center pin) to gain a little extra lift. The Zero Rates also allow either 1 or 1½-inch of front-to-rear centerpin adjustment to fine-tune axle placement in the wheelwell. Like the front, the rear axle is not perfectly centered from the factory, so we used the 1-inch adjustment hole to push the axle slightly to the rear.

The final piece of the puzzle was mounting the ORD 2½-inch-lift Shackle Flip Kit in place of B.O.B.'s factory rear spring hanger/shackle arrangement. This kit does exactly what the name says, with brackets that allow you to flip the shackle from one side of the hanger to the other and essentially turn it from a tension shackle to a compression shackle, while at the same time adding a predetermined amount of lift. Also available in a 4-inch lift version, if your existing rear springs are in good shape, the Shackle Flip Kit bolts in place of the previously riveted factory hanger and represents an easy, cost-effective way to gain rear lift without using



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blocks. Just like the front, poly bushings and greasable spring-eye and shackle bolts were used throughout in the rear.

Temporarily sitting on a set of borrowed 32-inch rollers, B.O.B.'s new suspension makes it look a little like a dude who took one too many steroids and skipped the leg-presses altogether. B.O.B. is also rolling around with its new rear axle loosely bolted to our Ruff-Stuff Specialties rear spring perches and no shocks, but all this will change with the next installment.

**10.** Before we could sling the driver-side rear spring into place, we needed to lop off the 90-degree elbow on the factory exhaust tailpipe to clear the spring's path to the now-lower shackle. Conveniently, you can make the cut just downstream of the last hanger and either leave the pipe as-is or add to it and dump it out the side or back. We're not sure where we want to do with it yet so we left enough meat to weld to down the road.

**11.** Since the spring-perch spacing is about 3-inches narrower overall on the mid-'80s GM 1-ton truck that the 14-bolt rear axle was scavenged from, we needed to buzz the original perches off with a plasma cutter before we could mate springs with axle. A grinder or torch would also get the job done but just not as quick or cleanly. Since we're swapping out B.O.B.'s aluminum NP208 T-case for something substantially stouter (stay tuned), we won't know where the output yoke is going to end yet or where the rear axle's pinion needs to be pointed for proper driveline angles. For now, we'll sandwich the RuffStuff perches between the springs and axletubes using new U-bolts so we can roll B.O.B. around.



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**12.** At this point we're ready to introduce B.O.B.'s new suspension to the new axles. Having a lift was mighty convenient and let us line up both axles with the spring centerpins on a quartet of 3-ton jackstands and bolt everything in place in one shot. It's jobs like this that make us appreciate Harbor Freight Tools for stuff like the Pittsburgh Heavy Duty jackstands seen here. It's tough to beat the company's cost-per-tool ratio when you need multiple versions of the same tool—especially considering that most of their stuff has held up extremely well to our abuse over the years. While we were at it, we also snagged a couple sets of the company's tall 6-ton jackstands to reach B.O.B.'s frame when it's done and rolling on 40s.

**13, 14.** B.O.B., pictured pre- and post-suspension surgery, now resting on some temporary rolling stock. With replacement spring packs, add-a-leaves (both additional leaves and Zero Rates), taller shackles, shackle-flip brackets, and lift blocks all still readily available for these older rigs, there are no shortage of ways to easily (and cost-efficiently, if you're on a budget) gain altitude and tire clearance. Each component of B.O.B.'s suspension was chosen for a purpose, and so far, our plan is coming together nicely. Fingers crossed that the apocalypse holds off 'til he's done. **FW**

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970/945-7777, offroaddesign.com

**BDS Suspension**  
517/279-2135, bds-suspension.com

**RuffStuff Specialties**  
916/600-1945, ruffstuffspecialties.com

**Harbor Freight**  
800/423-2567, harborfreight.com

# MINTY

## This Bronco crawls and flies

**By Ken Brubaker** ken.brubaker@fourwheeler.com

Photography: Ken Brubaker

**H**AVE YOU EVER SOLD A VEHICLE AND THEN INSTANTLY realized you made a big mistake? Chris Russell did, so he eventually tracked "his" rig down and bought it back. But there's a lot more to the story.

Chris says, "Minty was purchased for \$2,700 in May 2009. It was 100 percent bone-stock, with 120,000 miles, from its second owner. At the time, it was purchased as a daily driver, which would double as a work truck, being that I spend a lot of time working at tower sites on many Southern California mountaintops. The night we brought her home, we took the mother-in-law out to dinner. The moment she saw the truck, she blurted out, "Look! It's minty fresh!" due to the Broncos mint green color. The name has stuck ever since."

Right from the get-go, Chris had his own ideas about what the truck would be. "The first step was a set of extended 4x4 beams. I bought a set of Camburg cut-and-turned Dana 44 beams, which my brother and I extended 3 inches per side and then plated and trussed ourselves. We then took the stock axles, cut them in half, machined out a piece of solid stock chromoly for each side and burned them back together. The beams were mated up with a set of Camburg radius arms and a pair of Sway-A-Way coilovers and I was on the road. At the same time, I also installed the first set of Camburg extended shackles and Deaver leaf springs F53 pack, which are made for the F-150 but also compatible with the Bronco.

"The stock 3.55s weren't enough, so my father and I purchased 4.56 gears for the differentials. With his help, I set up and installed them myself. These helped a ton with the 35-inch tires that I installed shortly after purchasing the truck. Once all of this was finished, I drove Minty for almost a year, logging about 25,000 miles.

**➲** The fiberglass hood, front fenders, and bed sides are all from Fiberwerx. The front fenders feature 4½ inches of bulge while the rear fenders have 3 inches of additional tire coverage per side.



**1.** Underneath the front of the Bronco is the Twin-Traction Beam frontend that contains Camburg cut-and-turned Dana 44 beams that have been extended 3 inches per side by Chris, Camburg radius arms and mounts, owner-lengthened axleshafts, Detroit Truetrac, Yukon 4.56 gears, Sway-A-Way coilovers, and Sway-A-Way bumpstops.

**2.** A 35x12.50R15 Falken Rocky Mountain ATS tire resides at each corner and each is mounted to a 7-inch-wide Method Standard wheel.



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"In March 2010, shortly after our son was born, I received an offer from someone who wanted to trade his Ford F-250 diesel truck for my Bronco. At the time, this seemed like the practical choice, as it had four doors and would likely be more fuel efficient, so I went ahead with the trade. He was from Arizona, so we met in Barstow, California, and I watched her drive away. I regretted letting her go from day one. There wasn't a day that went by that I didn't think of my Bronco."

"About a year and half passed by (August 2011), and we found ourselves in a more stable financial position. I had already purchased a new 'fixer upper' Bronco, but I was missing *my* Bronco more than ever, so I set off to hunt her down. Facebook was my main tool for this. As it turned out, the individual who I traded the Bronco to had sold it nearly a year prior. A few more days of searching and I found her. She was owned by a guy in Lake Havasu, Arizona. I sent him a private message on Facebook, asking if he would be interested in selling the Bronco, and I explained that I

was the original builder of the truck. After some negotiations and haggling, we agreed that I would come to Havasu with \$5,000 cash and hopefully be bringing her home with me.

"From August 2011 to August 2012, the Bronco was barely driven due to everything being done. I caged the truck front to back (this was my Number One priority for the safety of my family). With the help of my good friend Mikey, we cut out the stock rear outer and inner fenders and 'tubbed' the truck. Mikey made custom plating on each side as the new wheelwells. The shocks are now in their own enclosure, right next to the rear passengers on either side. This allows for a 16-inch bypass shock and lots more wheel travel. I also upgraded to Deaver Spring Q80 leaf packs, which are specifically designed for Broncos. Fiberwerx fiberglass hooked me up with all of the fiberglass body panels (front and rear panels as well as hood). Twisted Stitch helped me out with a good deal on a set of custom matching seats, including a matching baby bucket to fit on the rear bench for our son," Chris says.

## ► "THESE PROJECTS ARE NEVER TRULY FINISHED, BUT I FEEL LIKE MY ORIGINAL VISION BACK IN 2009 HAS DEFINITELY BEEN MET, AND I'M PROUD TO SAY THAT MOST OF IT HAS BEEN BY MY OWN HANDS."

-CHRIS RUSSELL



**3**

**3.** Each front coilover is a 2½-inch-diameter Sway-A-Way 14-inch-travel remote-reservoir unit and each works in tandem with a 2-inch-diameter, 2-inch-travel Sway-A-Way bumpstop.

**4.** Under the hood, nestled in a custom cage, is the factory fuel-injected 351ci Windsor V-8. It draws air through a UMP air filter and exhales through 3-inch tubing and a SpinTech muffler. Other mods include a MSD ignition and an Optima YellowTop battery.



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More changes came along the way, and since then, the truck has logged over 10,000 miles, all of which have been “off-roading adventures.” Chris notes that the Bronco is driven to and from most every trip, and it’s not a trailer queen.

“Minty has been a reliable truck that has brought us to many beautiful and remote locations. The memories that she has given us are worth every penny of what has been spent. She now has 165,000 miles on the odometer and still kicking! These projects are never tru-

ly finished, but I feel like my original vision back in 2009 has definitely been met, and I’m proud to say that most of it has been by my own hands. It’s 100 percent garage-built with the help of a few friends,” Chris says.

We had a chance to see Minty in action, and it’s clear the Bronco is a well-designed, functional rig. The suspension is incredible and it worked very well, not only on the trail, but also during the numerous jumps it was subjected to.



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**5.** Power is routed through an E4OD four-speed automatic transmission that has a B&M pan and a TransGo shift kit. The stock BorgWarner 1356 transfer case transmits power to the axles via custom Drivelines Unlimited driveshafts.

**6.** All cargo is safely restrained using a chain-and-strap system. A Craftsman jack is secured via a Stewart’s Raceworks jack mount. The totes hold a variety of things including tools and extra fluids.

**7.** The rear bumper was made by Jubera Fab and includes a hitch receiver.

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**8.** Out back is a Currie F9 rear axle that has Sierra Gear & Axle 4.56 gears, Currie 35-spline axleshafts, and a Yukon spool. The disc brake system includes RuffStuff caliper mounts, Chevy 1-ton calipers, and 11-inch Dodge rotors. The suspension consists of Deaver leaf packs, Camburg shackles, Sway-A-Way bypass shocks, and Sway-A-Way bumpstops.

**9.** Tucked into each custom-tubbed wheel-well is a Sway-A-Way three-tube 16-inch-travel bypass shock and a Sway-A-Way 2-inch-diameter, 2-inch-travel bumpstop.



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**10.** Inside, modifications include a full rollcage made from 1.75-inch, 0.120 DOM tubing, Twisted Stitch seats, a console from a Ford Expedition, an Auto Meter water temp gauge, Pioneer/Alpine audio system, Winters shifter, four-place intercom with headsets, and Dynamat liner. Yes, the heater and A/C are in full working order.

## DATA GLANCE

### GENERAL

**Vehicle:** '96 Ford Bronco  
**Owner:** Chris Russell  
**Stomping grounds:** Dana Point, California  
**Build time:** 2009-current

### DRIVETRAIN

**Engine:** Ford 351ci Windsor V-8, Motorcraft oil  
**Transmission:** E4OD  
**Transfer case(s):** BorgWarner 1356 two-spd  
**Low range ratio(s):** 2.69:1  
**Crawl ratio(s):** 33.2:1  
**Front axle/differential:** Dana 44/Yukon 4.56 gears, Detroit TrueTrac  
**Rear axle/differential:** Currie F9, disc brakes/Yukon 4.56 gears, Yukon spool

### SUSPENSION

**Front:** TTB, Camburg cut-and-turned beams (extended 3 inches per side by the owner); Camburg Heim-jointed radius arms and mounts; Sway-A-Way 2.5-in-diameter 14-in-travel remote-reservoir coilovers; Sway-A-Way 2-in-diameter, 2-in-travel bumpstops  
**Rear:** Deaver leaf springs; Camburg shackles; Sway-A-Way 2.5-in-diameter three-tube bypass shocks; Sway-A-Way 2-in-diameter, 2-in-travel bumpstops

**Steering:** Stock except for Borgeson steering shaft

### TIRES/WHEELS

**Tires:** 35x12.50R15LT Falken Rocky Mountain ATS  
**Wheels:** 15x7 Method Standard

### MISCELLANEOUS

**Lighting:** 42-inch dual-row LED lightbar  
**Armor:** Jubera Fab rear bumper  
**Cool stuff:** UMP air filter, MSD ignition, Optima YellowTop battery, interior rollcage, Fiberwerx fenders and hood, secure cargo storage **FW**







# UPPING THE NON-FERROUS

## F-150

BDS 6-inch suspension for Ford's new aluminum '15 F-150

By Drew Riley [editor@fourwheeler.com](mailto:editor@fourwheeler.com) Photography: Drew Riley



**F**ORD'S NEW '15 F-150 IS SURE TO BE A POPULAR VEHICLE WITH ENTHUSIASTS EVERYWHERE. That's why BDS made quick work of producing a 2½, 4, and 6-inch suspension lift, even before the new '15 F-150s hit the showroom floor. BDS offers several options of its suspensions, with both strut spacers or replacement Fox coilovers to meet your height and performance needs. For this install, we went with the standard 6-inch lift system with rear Fox 2.0 shocks since BDS claims this setup is its most popular offering. Along with the high-clearance design and straightforward

install, this suspension has gone through all the government-mandated FMVSS No. 126 electronic stability control system compliance testing and was independently certified to not affect the on-road traction control systems. With so many of these new trucks being used to haul the family around as often as they haul gear and hit the trail, these kits ensure safety on the highway and improved performance when it's locked into four-wheel drive.

For the install, we turned to Eastern Truck & Accessories, a full-service install shop in

Norfolk, Virginia. Eastern Truck & Accessories has been in the business for more than a decade catering to the needs of military and civilian truck and Jeep enthusiasts around the mid-Atlantic coastal region. The company offers services from mild to wild and has a jaw-dropping showroom to check out all the latest off-road, performance, lighting, and recovery equipment. The team at Eastern Truck made quick work of the install on our test F-150, methodically installing the kit, aligning, test driving, and stopping for photos all within

the same day. Check out the install highlights and be sure to visit [fourwheeler.com](#) for a full step-by-step on the whole installation.

**1.** The 6-inch system from BDS Suspension includes everything needed to complete the install including front and rear high-clearance crossmembers, ductile iron steering knuckles, differential relocation components and skidplates, sway bar relocation components, strut spacers, driveshaft extension, support gussets, rear blocks, and your choice of shocks.

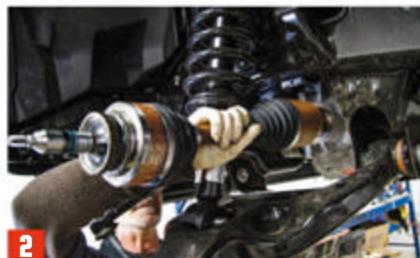
**2.** With the steering knuckles removed, the CV shafts can be pulled from the differential housing. A hammer can be used to dislodge the spline connection. When pulling the driver side, be sure to cap the hole with a rag to keep fluid from leaking. This will make removal of the differential easier in the upcoming steps. With less than 100 miles on the truck, we were surprised to find a fair amount of rust already beginning on several of the stock components like the CV axles, driveshaft, and ball joints.

**3.** With the lower control arms removed, the next step is to remove the front differential. Start by disconnecting the front driveshaft and securing it up out of the way. Using a transmission jack or a couple of buddies, the differential can be finagled down and around the factory rear lower control arm brackets and steering rack.

**4.** With the front suspension removed, the rear lower control arm pockets must be trimmed to provide adequate clearance for the differential in its new position. BDS provides detailed instructions on how to measure out these cuts to make this step of the install less unnerving on a brand-new truck.

**5.** After prepping the surface, the provided support plate is welded in place on the driver side to add extra rigidity and tying the lower control arm to the frame. The plate and trimmed lower control arm pockets can be painted and then the differential can be reinstalled using the supplied differential relocation brackets.

**6.** Next to be installed are the front and rear BDS dropped crossmembers that reposition the lower control arm mounting points. These crossmembers are a high-clearance design built from  $\frac{1}{4}$ -inch steel with built-in cam slots for camber adjustment. Once the crossmembers are installed, the stock lower control arms can be reinstalled using the supplied cam bolts.





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**7, 8.** BDS offers two options to lift the '15 F-150. The top-mounted strut spacer (left) retains the factory ride quality, while the Fox 2.5 remote-reservoir coilovers (right) provide improved on- and off-road performance. For this project we're installing the standard 6-inch BDS kit that uses the top-mounted strut spacer.

**9.** The stock cast-aluminum steering knuckle is next to the ductile iron BDS unit. The new BDS knuckles use an elongated neck to allow the factory F-150 upper control arms to be used in their original mounting position. The new BDS part also relocates the steering arm mount higher up so it's still compatible with the stock electric steering



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**10.** With the struts mounted, the next order of business is installing the steering knuckles. Begin with the lower mount and install loosely. From there, a prybar can be used to force the upper control arm down to connect the upper mount on the knuckle. Then, the sway bar can be reinstalled using the relocation brackets that tie into the rear lower control arm crossmember.



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**11.** The front billet aluminum driveshaft spacer installs between the driveshaft flange and the pinion flange using extended hardware that gets torqued to 76 lb-ft. Good shops will use a paint pen or any bolt it touches to ensure the hardware remains tight at a glance.

**12.** With all the ABS and vacuum lines reconnected and brakes reinstalled, the final piece is installed with a differential skidplate tying the front and rear crossmembers together for additional rigidity.

**13.** After securing the axle, the factory U-bolts are loosened and the rear axle can be lowered to remove the factory 1 1/4-inch-thick block. With the new BDS-supplied centerpins in place, the 5-inch BDS cast-iron blocks are installed. Since the factory blocks are just over 1-inch tall, this nets 4 inches of lift in the rear to level the stance. BDS includes new black e-coated U-bolts. The blocks have an integrated bumpstop pad to limit suspension compression under extreme situations.



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**14.** A brake line relocation bracket is installed in the rear to prevent over-extension as the rear suspension drops out. Finishing off the installation is a pair of Fox 2.0 performance shocks.

**15.** The rolling stock used on this truck is comprised of 35x12.50R20 Cooper Discoverer STT tires on 20x10 Helo 886 wheels. With an alignment rack on site, Eastern Truck & Accessories reported that this truck took nearly no adjustment to the camber, caster, and toe with the BDS kit installed.

**16.** On the road, this '15 Ford F-150 rides smooth, looks great, and is ready for an off-road adventure. The kit is FMVSS No. 126 compliant so there is no worry about if it will affect the on-road performance, especially in the event of an evasive maneuver. FW

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757/461-2600, etaoffroad.com

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**Cooper Tire**  
419/423-1321, coopertire.com

**Helo Wheels**  
wheelpros.com

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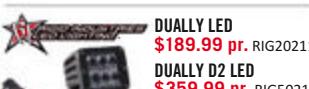
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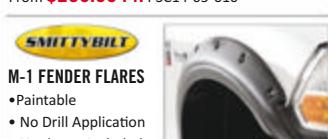
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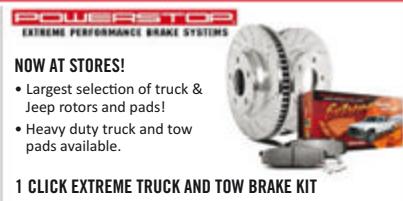
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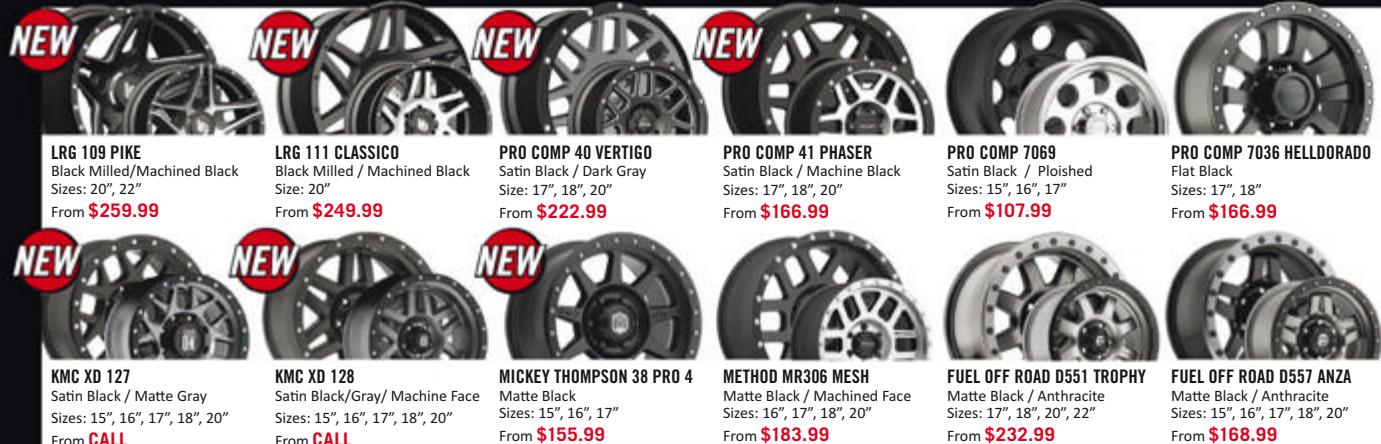
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# DODGE TO RAM

## A pickup spotter's guide

By Jay Kopycinski editor@fourwheeler.com Photography: Jay Kopycinski and Chrysler Group

**D**OGE STARTED BUILDING 4WD PICKUPS AFTER WWII AND HAS SINCE RACKED UP NEARLY SEVEN decades of providing them to consumers. Many were built under the Dodge name as W-Series pickups and they would later be known as "Ram Tough" and the 4WD pickups would be known as Power Rams. The brand would eventually drop the Dodge moniker and become known simply as Ram trucks. We'll take a look at some of the popular ½-ton 4WD versions that were developed over the years.



### 2nd Generation (1965-1971)

By the '60s, the Dodge pickups had been carrying the "D" designation for 2WD models and the "W" designation for the 4WD models. The '65 model year saw a new design of the

trucks. Wheelbase was 114 inches for the 6½-foot bed and 128 inches with the 8-foot bed. Suspension consisted of front and rear leaf springs, and brakes were originally manual drum-drum configuration. Power assist brakes would become an option for the '68s. Power steering was also an option in these years.

Dodge started using the LA series engines in place of the previous A-series powerplants. It offered the 225ci Slant I-6 and 318ci V-8 most commonly in the 4WD trucks. Common transmissions included the A230 and A745 three-speed manuals, NP435A dual-spaced ratio, four-speed manual, or the NP435B

geometric ratio, four-speed manual. For an automatic, it was the three-speed Loadflite (Torqueflite version for trucks) transmission.

Axle ratios were typically 3.54:1 or 4.10:1. Front axles were Dana 44s, while rear axles were the 30-spline Chrysler 8½-inch units or the 27-spline Chrysler 8½-inch models in some trucks. A rear Anti-Spin differential was often an option.

Earlier trucks through about '68 models ran the cast-iron, gear-drive NP201 transfer case (1.96:1 low range), with late models getting the cast-iron, gear-drive NP205 transfer case with the same low-range ratio.

## 3rd Generation

(1972-1980)

For the '72 model, Dodge introduced a new body style with more rounded body lines. The heavier ½-ton version truck, the W150, was introduced for '77, while the lighter W100 continued to be offered.

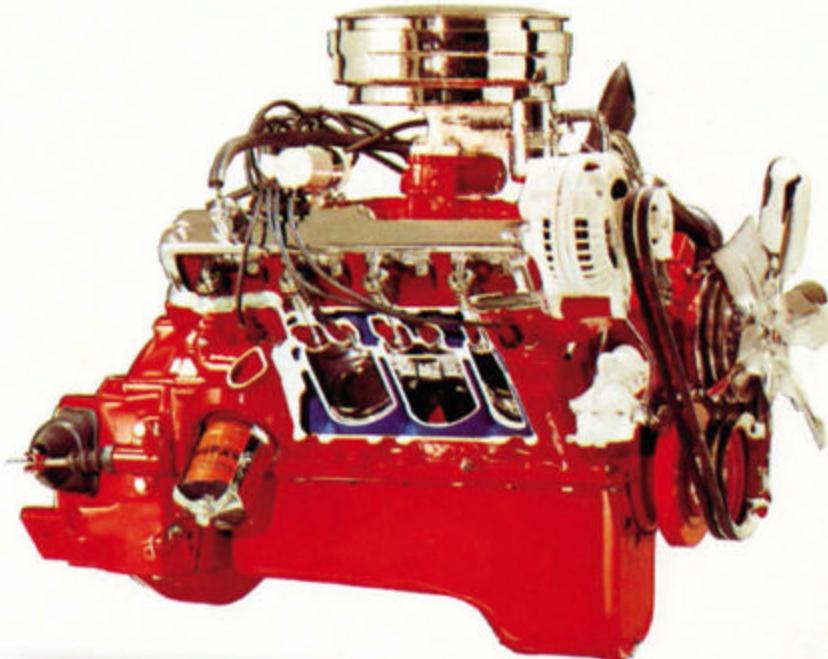
The suspension remained traditional leaf springs front and rear, with recirculating-ball power steering as an option. Brakes were power assisted front disc and rear drum.

Engines included the 225ci I-6, 318ci V-8 and 360ci V-8. The V-8 engines were again the Chrysler LA-series engines.

Common transmissions were the A230 three-speed synchronized manual (mostly behind I-6 engines), NP435 four-speed manual (6.68:1 First gear) or the NP445 close-ratio four-speed manual (4.56:1 synchronized First gear). For an automatic, it was the three-speed Loadflite.

The front straight axles were Dana 44 units, while the rear axles were Chrysler 8½-inch or 8¾-inch units. The 31-spline Chrysler 9¼-inch axle would also come into use in about 1977. The older Dodge ½-ton trucks can easily be upgraded to the larger axles from a ¾-ton or 1-ton trucks from this era, and many of the OEM parts are bolt-on compatible.

The NP205 transfer case would serve a few years in this generation and then there was full-time 4WD provided using a cast-iron, chain-drive NP203D transfer case (2.0:1 low range) from '74 to '79. Inside, an interaxle differential was used to allow for varying speeds between the front and rear axles on harder



Steve Walsh's classic '70 Dodge pickup is actually a W200 ¾-ton model. He's now running Dana 60 front and Dana 70 rear axles to turn the 38-inch Swampers, but pre-'69 W100 trucks had the same axles as the W200 models.

surfaces. The transfer case had five settings: High, High Loc, Low, Low Loc, and Neutral. The center differential was locked by placing the transfer case in one of the Loc modes to deliver equal power to both axles.

The NP203D offered drivers the convenience of full-time 4WD but did consume more fuel and wear out the front axle parts at a faster rate than a part-time system. Front axle bearing wear could also be a problem. Mile Marker offered a kit to convert the

Late '60s and early '70s Dodge trucks commonly used the 318ci V-8 as an option over the standard Slant 225ci I-6. The bigger 360ci V-8 would become an option in the third generation W-Series trucks and later two-barrel carburetors would give way to four-barrel versions.

transfer case to part-time operation and freewheeling hubs could be swapped on the front axles.

In '80 trucks, Dodge started using the part-time, aluminum case, chain-drive NP208D transfer case (2.61:1 planetary low range).

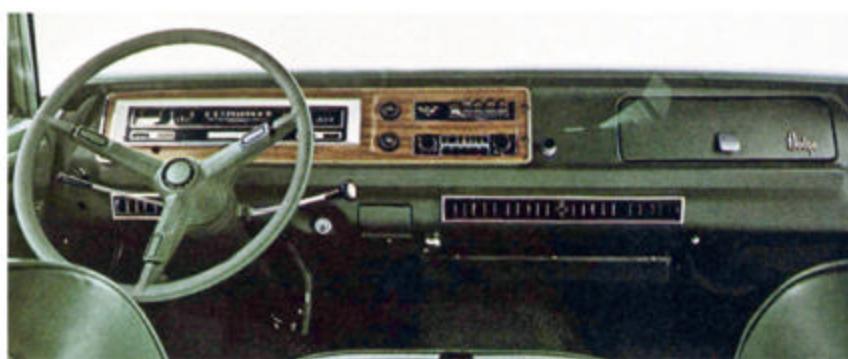
## 1st Generation Dodge Ram

(1981-1993)

In '81, the 4WD trucks were deemed Power Rams and Dodge brought back the iconic Ram's head hood ornament that had last seen use on Dodge trucks in the '50s. The body was restyled again with updated sheetmetal, grilles, rectangular headlights, and an interior makeover. Models included the standard cab truck, Club Cab (except '83-'90), and crew cab (through '85s). Dodge continued to offer the 6½-foot and 8-foot beds. Standard cab, short-bed models had a 115-inch wheelbase, and the line stretched out to a long 165-inch wheelbase for the crew cab longbed model. The '89 model year saw the last of the W100 trucks.

The I-6 and V-8 engines continued in the line, and the 318ci V-8 got a four-barrel carburetor. The I-6 got electronic spark advance

Those early year trucks had simple interiors with mostly all-metal dashes. Like many pickups of this era, the gas tank sat in the cab behind the bench seat.





● In 1972, Dodge introduced a new body style for its pickup trucks. The doors were longer for easier cab access and there was improved visibility. The Club Cab model was also introduced to provide extended cab room.

and a hydraulic clutch later for the '87s. In '88 vehicles, the 318ci V-8 got throttle-body fuel injection (TBI), and the larger 360ci V-8 got the TBI a year later. The '92 trucks enjoyed an engine update for the first time in decades to Chrysler's new Magnum engines. The I-6 engine was replaced with a multi-port fuel-injected 3.9L V-6. Multi-port fuel injection was also introduced in '92 on the Magnum 318 and then on the Magnum 360 in 1993.

The NP435 four-speed manual transmission was still available during much of this time. The three-speed auto served through

about the '89s and was then replaced with the A518 four-speed auto (0.69:1 overdrive).

The NP208D continued to be the transfer case of choice through the '87s. Starting with the '85s, Dodge stated its Ram Trac transfer case allowed shifting in and out of 4WD at speeds up to 55 mph thanks to a sliding collar mechanism in the front axle to engage and disengage front drive. We know it as Central Axle Disconnect, or CAD. It operated from a



● Dodge began to use the NP208D transfer case in 1980. This chain-drive unit replaced the previous NP203D. This was combined with the use of automatic locking hubs on the front Dana 44 axle.

vacuum motor to move the collar mechanism. These systems often proved to be troublesome as they aged and suffered vacuum loss.

Starting in the '88s, the aluminum-case, chain-drive NP241D transfer case (2.72:1 low range) was used going forward. In the '89s, rear antilock brakes were added as standard equipment.

## 2nd Generation Dodge Ram [1994-2001]

A new body style was again introduced for the '94 model year. It had a big rig look of the dropped fenders and a front grille that lifted up with the hood and set the auto-buying world



Photo: Four Wheeler archives

● In 1986, Dodge released a limited number of Rod Hall Signature Series W150 prerunners with bright body graphics. This factory-upgraded 4WD truck had 33-inch BFG Mud-Terrains, bed-mounted lightbar, front brush guard, and off-road lights. Impending lift laws and foresight by Hall and Dodge led to the creation of a truck consumers could buy. Hall wanted more than just looks to the truck and spent several years working with Rancho to find a suspension setup he felt worked best to push this 360ci-powered truck through the desert.



● Lift kits for these are simple and affordable, as are most older solid-axle lifts. This '84 Power Ram is sitting on a 4-inch lift with 35-inch tires.



● Here's the solid axle chassis and suspension layout on the '83 Power Ram. Front axle would have been a Dana 44, while the rear axle came in several flavors in this generation.



● The newer trucks were getting nicer and nicer interiors due to rising consumer demands for creature comforts. This '94 model had the now-common bucket seats and molded door panels.

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on its side. It was available originally only in a standard cab configuration and the truck was now known as the Ram 1500, 2500, or 3500.

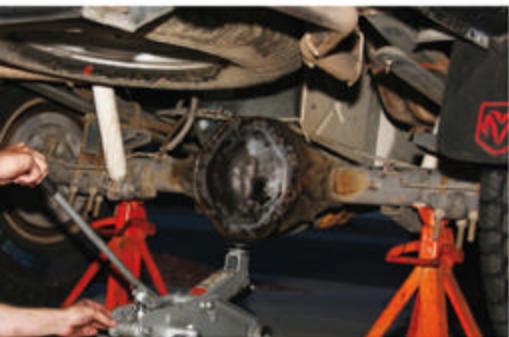
Dodge would move from front leaf springs to coils with the '94 model, running a linked front suspension. Leaf packs still suspended the rear of the truck. Front axles continued to be the Dana 44, while the rear axle was most often a Chrysler 9 1/4-inch. Axle ratios ranged from 3.54:1 to 4.09:1. Optional four-wheel ABS also became available on this generation Ram truck.

Dodge would continue to offer the 3.9L V-6, 5.2L V-8, and 5.9L V-8 Magnum engines. By the time the '96s came around, the automatic transmission was electronically controlled. Auto transmissions were typically the A518 (46RH) with 0.69:1 overdrive. The five-speed manual was usually the NV3500 (0.73:1 overdrive) or NV4500.

Transfer cases continued to use a 2.72:1 planetary low range and the Ram 1500 came equipped with the NP231DHD model. Some were manual shift and some were electric shift models.

## 3rd Generation Dodge Ram (2002-2008)

This new body design took about 3 inches from the bed length and added it to the cab length, leaving the overall length of the truck about the same. Underneath, the truck



Many Power Rams have come with the Chrysler 9 1/4-inch C-clip rear axle over the last several decades. Many years offered rear limited-slip units that used oiled clutch packs from the factory. These are rebuildable and can be refreshed with new clutch packs.



The '94-'01 trucks would offer a straight front axle with a linked, coil-spring suspension. The set-up used four parallel links plus a lateral track bar. The rear retained the traditional leaf packs.



A new Club Cab debuted for the '95s and had swing-out quarter windows for the rear passengers. Then for the '98s, the Quad Cab was introduced as a Club Cab with reverse-hinged doors for easier rear seat access.

had a new chassis and suspension for this generation. The Ram 1500 no longer used a straight front axle and now had torsion-bar



Dodge would offer the modern 5.7L Hemi V-8 starting in 2003, replacing the previous 5.9L Magnum engine. It bested the power output of the older engine by about 100 hp. Induction was via sequential multi-port fuel-injection to the pushrod engine. It would serve throughout the reign of the third generation Power Ram and beyond.



The third generation Power Ram starting in '02 would come with torsion-bar independent front suspension (IFS) using a Chrysler 8-inch IFS differential. At this point, Chrysler also swapped to using rack-and-pinion steering with the new independent frontends. The Club Cab was no longer available, but there was now a four-door extended cab version. FW

independent front suspension (IFS) with rack-and-pinion steering. The rear leaf springs remained but were lengthened about 3 inches. Four-wheel disc brakes were introduced in this generation, with a four-wheel ABS option.

Engines in these years were the 3.7L V-6, 4.7L V-8, 5.9L Magnum V-8, and the 5.7L Hemi V-8. Then, for the 2006 model year, a new multi-displacement system was used on the 5.7L Hemi to improve fuel-efficiency. Under light-load or cruise conditions the engine would shut down four of the eight cylinders to conserve fuel.

Transmissions for the third generation 1500 4WD were commonly the four/five-speed 45RFE (four-speed with an extra kick-down Second gear), then later a five-speed automatic transmission (545RFE) was offered to replace the 45RFE behind the V-8 engines. Manual transmission was typically the NV3500, then changing to the six-speed Getrag in 2005. The common transfer case at this point was the NP24xD series where the 'x' offered T-case variations (all 2.72:1 low range), with some manual and some electric shift. Axle ratios were usually 3.55:1 or 3.92:1.

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# Top-tier shocks for your 4x4

By John Cappa editor@fourwheeler.com Photography: Courtesy of the Manufacturers

**I**T DOESN'T MATTER IF YOU ARE SEARCHING FOR HIGH-END BOLT-ON SHOCKS THAT FIT YOUR STOCK 4X4, or if you are building a one-off creation with custom shock mounts, the top-tier aftermarket shock industry is blossoming bigger and brighter than it ever has. We've compiled the companies that offer high-performance off-road shocks that fit or can be fit to your 4x4. Most of these companies offer many different shock models, so if you don't see what you like here, don't be shy—head on over to the company's website.

# SHOCKING

## ARB

ARB recently jumped into the high-end shock market with the Old Man Emu BP-51 externally adjustable internal bypass shock. The shocks are designed to utilize existing mounting locations on Jeep and Toyota 4x4s to allow bolt-on installation without the need for additional vehicle modifications. The shocks feature a 51mm-diameter bore. In addition to the velocity-sensitive damping, BP-51 shock absorbers also generate damping dependent on the position of the piston within the shock absorber's body via the bypass design. The bypasses are independently adjustable for both rebound and compression damping. This shock valving combination is said to provide the best of both worlds, with a comfortable and compliant ride during normal driving and a more controlled ride over rough terrain. With increased damping at each end of the stroke, the shock piston slows as it approaches full compression and extension, preventing harsh topping and bottoming out of the suspension.

Each shock absorber body is manufactured using aircraft-grade 6061 anodized aluminum to dissipate heat and provide corrosion resistance. **INFO:** ARB, 866/293-9078, arbusa.com



## BILSTEIN

The new Bilstein 8125 Series is said to be designed specifically for the serious off-road enthusiast. The new monotube coilover shocks are available in 46mm (2-inch) and 60mm (2.65-inch) diameters in 8, 10, 12, 14, and 16-inch travel lengths. The company also offers short-body versions of the 60mm coilovers for those who are fitting shocks into confined spaces. Each shock features a zinc-plated threaded body with dual-rate coilover hardware. The remote reservoir with a large -8 AN hose provides greater resistance to heat, and the high temperature seals are said to extend the life of the shock. The shocks cycle via a 22mm case-hardened piston rod and have industry-standard  $\frac{3}{8}$ -inch bearings at each end for mounting. The 8125 Series shocks are designed to be owner rebuildable. All components are billet machined and made right here in the USA. There are no cast parts used. Bilstein offers a full line of high-end shocks for custom and race applications as well. **INFO:** Bilstein, 800/537-1085, bilstein.com

## EVO MANUFACTURING

EVO Manufacturing specializes in modifying the '07-current Jeep Wrangler JK. The company offers several different kits that include King shocks with EVO-spec shock valving for the JK. These kits range from bolt-on adjustable performance shocks that fit stock applications, to complete bolt-on coilover kits and Double Throwdown EVO Lever cantilever long-travel coilover kits with bypass shocks. The shock kits are designed to fit most aftermarket suspension systems for ease of installation on nearly any JK Wrangler. Kits with bypass shocks can be tuned externally to match your driving style or compensate for the weight of extra gear or people in the back of your Jeep. **INFO:** EVO Manufacturing, 714/879-8913, [evomfg.com](http://evomfg.com)



## FABTECH

Fabtech offers a full line of 2, 2½, 2½, and 4-inch high performance Dirt Logic shocks. The company has expanded the line of high-end Dirt Logic shocks to include adjustable piggyback and adjustable remote-reservoir shocks. This new design gives the user the ability to change the compression damping of the shock while on the vehicle. A 10-way knob with detents allows for wide range of adjustments to suit many different driving conditions. The adjuster features the exclusive Fabtech Port Flow system. Shock fluid is channeled through specific-sized ports between the reservoir and shock body, controlling the compression forces of the shock as it cycles.

Each detent provides a different sized port for the fluid to pass through. Also new for 2015 is that all Dirt Logic shocks feature a 304 stainless steel body and black NitroSteel piston rod for maximum corrosion resistance. **INFO:** Fabtech, 877/432-2832, [fabtechmotorsports.com](http://fabtechmotorsports.com)



## FOA

The FOA OEM shock upgrade kits are said to provide an easy, hassle-free, bolt-on installation for your '07-current Jeep Wrangler JK. No cutting or welding required. The FOA shock kits are available for Jeep JKs with lifts from 0 to 6 inches. The 2-inch-diameter shocks are made from zinc-plated 1026 steel and feature black anodized aluminum components. Also new from FOA is the External Compression Adjuster available for 2 and 2½-inch shocks. The External Compression Adjuster gives you the ability to adjust compression damping from super soft to super firm with the twist of a knob. This feature can soften your ride when just cruising or firm up the compression when hammering over rough terrain or carrying additional gear. **INFO:** FOA, 855/362-7469, [f-o-a.com](http://f-o-a.com)



## FOX SHOCKS

You'll find Fox shocks on factory applications ranging from mountain bikes, UTVs and snow machines, to the '17 Ford Raptor. However, the company offers a full line of aftermarket universal air, smooth-body, coilover, and adjustable bypass shocks, as well as bolt-in performance shocks for many popular 4x4 applications. The latest includes the adjustable Dual Speed Compression (DSC) shocks for the '07-current Jeep Wrangler JK. The DSC adjusters provide tuning for on-road use while also offering more aggressive damping for use off-road. The simple adjusters increase both low- and high-speed compression levels up to 25 percent, giving you the ability to maximize small bump compliance and traction while still having the extra damping required for big hits. **INFO:** Fox, 619/768-1800, [ridefox.com](http://ridefox.com)

## ICON VEHICLE DYNAMICS

Icon Vehicle Dynamics offers a slew of bolt-on high-end aftermarket shock applications for Dodge, GM, Ford, Jeep, Nissan, Toyota, and other international models. Newest in the lineup are the 2½-inch vehicle-specific coilover shock with a Compression Damping Control Valve (CDCV), the 2½-inch vehicle-specific Omega Series two-tube bypass shock, and the 2½-inch vehicle-specific piggy-back or remote-reservoir shock with CDCV. Each shock is made here in the USA. They feature precision-honed steel shock bodies with corrosion-resistant CAD plating, FK rod end bearings, and are user tunable and rebuildable. Icon bypass shocks offer compact tube design with infinite tube clocking positions for ease of fitment on modified vehicles and tool-free adjuster knobs with defined detents for easy adjustments. The company also offers universal 2 and 2½-inch shocks for custom applications.

**INFO:** Icon Vehicle Dynamics, 951/689-4266, [iconvehicledynamics.com](http://iconvehicledynamics.com)



## ORI STRUTS

The STX from ORI Struts is more than just your typical air shock. STX struts are compact, internally bypassed, nitrogen-charged long-travel suspension systems. The light weight struts are said to be designed to handle a high load capacity and control body roll. Each strut features a dual pressurized chamber and other internal features that are said to provide stability in fast turns and on off-camber side hills. The design is said to allow most users to eliminate sway bars, external bumpstops, and limiting straps. Each STX strut can be easily tuned by simply adjusting nitrogen gas pressures. Available in lengths from 8 to 20 inches of travel, the STX struts can support up to 1,900 pounds each. The STX Strut is velocity-sensitive with seven-position externally-adjustable rebound damping. They feature an internal hydraulic bumpstop on the compression stroke, a hydraulic end-of-stroke cushioning at full extension, cooling fins to dissipate heat, a massive 1½-inch piston shaft, and 5,000 psi seals. Both ½-inch and ¾-inch mounting points are available. **INFO:** ORI Struts, 770/258-1554, [oristruts.com](http://oristruts.com)



## KING SHOCKS

In addition to a full line of race and enthusiast smooth-body, coilover, air, and bypass shocks, King offers high-performance bolt-on shocks for many popular applications. The latest is the '15 Chevy Colorado OEM Performance kit, which includes two front 2½-inch remote-reservoir coilover shocks and two rear 2½-inch piggyback-reservoir shocks. The shocks are specifically tuned for on- and off-road use. They are 100 percent bolt-on and require no cutting or welding to mount. The standard front kit increases ride height by 2 inches to allow for larger tires and serves as a leveling kit. The front kit also increases wheel travel by 12 percent. The rear wheel travel is increased by 15 percent. An extended-travel version of the front shock is also available for use with an upper arm kit. These front shocks increase wheel travel by 23 percent. **INFO:** King Shocks, 714/530-8702, [kingshocks.com](http://kingshocks.com)

## KNIGHT STALKER

You may have seen Knight Stalker nitrogen shocks on monster trucks, but the company offers several variants that include Stage I (2½-inch diameter), Stage II (3-inch diameter), and Stage III (4-inch diameter) versions to support the lightest and heaviest of 4x4s. The less-complex Knight Stalker air shocks are offered in Stage I and Stage II diameters. The shocks come in travel lengths of 6 to 30 inches, depending on the model. Stage III shocks are available with bypass tubes. Knight Stalker shocks are fully adjustable to vehicle weight and ride height, and they feature independent valving for compression and rebound movement. There are no mechanical springs. No mechanical energy is built up and the release is said to always be controlled. **INFO:** Knight Stalker, 608/877-1044, [knight-stalker-ent.com](http://knight-stalker-ent.com)





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## PRO COMP

The new Pro Comp Pro Runner Black Series shocks are arguably the most advanced shocks that Pro Comp has ever offered. Each shock is a hand-crafted assembly. The Black Series smooth-body shocks are 2 inches in diameter, and the coilovers feature massive 2½-inch bodies. Both models have black anodized aluminum end caps, a bright zinc plating with a UV protecting clear top coat, and are finished off with a gloss polyurethane clear for added protection against the elements. Other features include Viton O-rings and NitroCarb shafts.

Coilovers include coil springs. Both the coilovers and smooth-body shocks are completely rebuildable. Current applications include '07-'15 GM ½-ton pickups, '09-'13 Ford F-150s, '07-'15 Toyota Tundras, and '05-'15 Toyota Tacomas, with shock valving and spring rates customized specifically for each application. **INFO:** Pro Comp, 800/776-0767, [procompusa.com](http://procompusa.com)

## RADFLO

Radflo offers a full line of smooth body, coilover, air, and bypass shocks. The company also offers bolt-in OE replacement shocks for many different production domestic and import vehicle applications, including the new two-tube bypass shocks for the '07-current JK Wrangler. Radflo OE replacement shocks feature an SSID alloy steel tube, a mirror-polished Nitro Steel rod, rebuildable seals, CNC-machined 6061 or 7075 aluminum body caps and eyelets with black anodizing, and optional finishes including a mirror polish, clear cadmium plating, and chrome. Other new Radflo shock items include the Stealth Bypass series dressed in all black and the Radflo high- and low-speed adjusters, which are available on several different model shocks. **INFO:** Radflo, 714/965-7828, [radflo.com](http://radflo.com)



## ROCK KRAWLER

Rock Krawler offers up a fleet of high-end RRD shocks. The RRD 2-inch-diameter shocks are available in fluted-aluminum smooth-body and 2.625-inch-diameter fluted aluminum smooth-body and coilover versions. Bolt-on 2-inch applications for most new-model Jeeps are also available. The flutes machined into the aluminum shock bodies are said to increase the cooling surface area and reduce overall weight without affecting the strength. Each shock body is treated with a military-grade hard-anodized coating for corrosion resistance. The RRD shock shafts are made from ¾ or 1-inch NitroTec Steel and the RRD race shocks are plugged with a 1-inch polished 17-4 PH stainless steel shaft. A six-month warranty against defects in materials and workmanship is included with every Rock Krawler RRD shock. **INFO:** Rock Krawler, 518/270-9822, [rockkrawler.com](http://rockkrawler.com) FW



## PURE PERFORMANCE

Pure Performance offers 2-inch-diameter fluted-aluminum smooth-body Prodigy shocks; 2.625 and 3.25-inch-diameter fluted aluminum smooth-body and coilover Prodigy shocks; and 2.625-inch-diameter Prodigy bypass shocks, as well as bolt-on Direct-Fit applications for Ford and Ram trucks. The fluted aluminum body is said to reduce weight

without sacrificing strength. The fluting also increases the surface area for improved cooling. The shock bodies are treated with a military-grade hard-anodized coating to fend off corrosion. The shafts are made from massive ¾ or 1-inch NitroTec Steel or 1-inch polished 17-4 PH stainless steel, depending on the shock model. All Pure Performance Prodigy shocks come with a six-month warranty against defects in materials and workmanship. **INFO:** Pure Performance, 518/270-9822, [pure-performance.biz](http://pure-performance.biz)



## SWAY-A-WAY

Along with a full line of length-specific universal off-road race-style shocks, Sway-A-Way now offers bolt-in high-performance shocks for several applications. These include the '07-current Jeep Wrangler JK and '14-'15 Ford F-150. The JK 2½-inch-diameter bolt-in bypass shocks are said to offer a smooth comfortable ride, yet still have the ability to handle even the roughest terrain at speed. The Sway-A-Way 2½-inch-diameter remote-reservoir coilovers for the '14-'15 Ford F-150 provide up to 2 inches of lift. They are designed to level the truck and are said to provide a comfortable ride on- and off-road. The F-150 coilovers come with a zinc plated 4142 bar pin and Grade 8 hardware. Also new at Sway-A-Way are custom colors for the entire shock lineup from race shocks to OEM fitment shocks. **INFO:** Sway-A-Way, 818/700-9712, [swawayaway.com](http://swawayaway.com)



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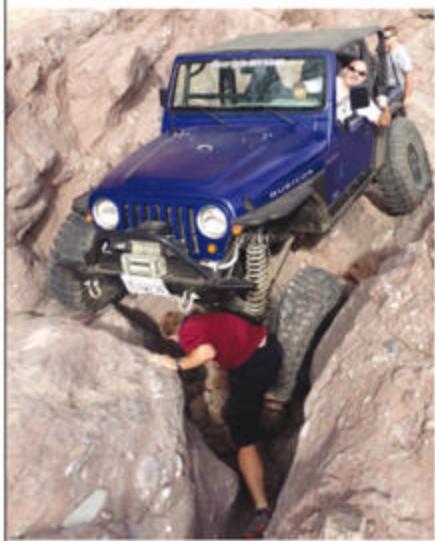


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### TYPE M18

MATTE BLACK OR  
MATTE GRAPHITE W/  
MACHINE BEAD LIP & BOLTS

15X8 | 17X9 | 18X9 | 20X9



## STRUTS AND STRAPS

**Q** The story "GI Gyp" (Dec. '14) was an eye opener as everyone talks about the gas-filled bumpstops. The article made me think of a couple of related topics, including the use of limit straps and shocks versus coilovers.

In my included pic, you'll see why I bring up the desire to know about limit straps. The driver-side front suspension drooped into a crevasse so big that someone could walk in it. I'm guessing that the axle hanging that low is dangerous for driveshaft longevity.

Another cool article would be about shocks versus coilovers versus struts. Reason being is that after I managed to get out of that crater, a Jeep with coilovers made it look easy. I'm guessing that going to coilovers and mounting them outside the frame would be a relatively cheap upgrade, but for slow rock-crawling, would the expense of ORI struts be worth it? I hear that with ORI struts you can eliminate a bunch of things like bumpstops, limit straps and sway bars, but at \$1,400 for two, they are not cheap.

Also, how the heck do you know how long a limit strap should be and how do you measure how long a shock with a raised mount should be? I figure these are topics a lot of people would be interested in.

Thanks again for helping those of us who are doing our damnedest to get out into the wild blue yonder.

ALFRED RICCI  
VIA EMAIL

## WHERE TO WRITE

Have a 4x4 tech question you want answered in Techline, drop an email to [editor@fourwheeler.com](mailto:editor@fourwheeler.com) or head on over to our forums at [fourwheeler.com](http://fourwheeler.com). All letters become the property of Four Wheeler, and we reserve the right to edit them for length, accuracy, and clarity. Due to the volume of mail, electronic and otherwise, we cannot respond to every reader, but we do read everything.

**A** Coilover shocks have garnered a lot of attention from the enthusiast market over the last several years as the shocks became more affordable. Unfortunately, it's nearly impossible to attribute ultimate success over a particular section of trail to one specific component of your vehicle. There is so much more to consider including weight, center of gravity, and the fact that taking a line that is only 1 or 2 inches to the right or left can provide incredibly different results.

ORI ([oristruts.com](http://oristruts.com)) STX struts are nitrogen air shocks with externally adjustable rebound valving, three-stage compression stroke with built-in hydraulic and mechanical bumpstops, and park-position tuning for reduced unload-ing. Each strut is designed to support up to 1,300 pounds, which makes them ideal for lightweight 4x4s. On larger vehicles, multiple struts can be installed independently or even interconnected to act as one unit. ORI struts have some distinct advantages over coilovers and conventional nitrogen shocks. When tuned properly, they can be a lot more stable and provide more predictable suspension move-ment, especially in precarious situations like the one you have pictured. Even though the ORI struts have built-in bumpstops, I would still recommend at least a small thin bumpstop that makes contact at full compression to help dissipate any heavy loads that could bend or break the mounting bolts or damage whatever strut mounts that you fabricate. I'd also recom-mend using limit straps for the same reason. When ORI struts are properly adjusted, you can eliminate the need for a sway bar.

When selecting limit straps you need to inspect the suspension and drivetrain under your 4x4 very closely. You should cycle the suspen-sion and find out when and where components like driveshaft yokes and shocks bind or top out. Once you find that location, you can identify a suitable spot to mount the limit straps and mounting tabs. Take a measurement between the eyeholes of the mounting tabs. Most limit straps will stretch up to 1 inch per foot of length under heavy use, so subtract an inch from whatever measurement you take before ordering your limit straps.

Selecting your shock length can be done similarly. You need to consider upper and lower shock mounting locations when you cycle the suspension. Make sure there is plenty of room for the tires to compress into the wheelwells. Most people make the mistake of ordering shocks that are too long for their application. This often results in costly returns, overly tall

vehicle builds, and the need for holes in the body panels for the shocks to pop through. Don't become too fixated on a specific shock length—buy what fits. In the end, the additional wheel travel afforded by the overly long shocks seldom outweighs the drawbacks of making them work in too confined of a space.

## CHEVY SPINNING

**Q** Is there a kit to make my '03 Chevy ZR2 driver-side tire into having power like passenger side? When I turn on four-wheel drive, I want power at all four tires.

MIKE STIFFLER  
VIA EMAIL

**A** What you are experiencing is the draw-back of an open differential. An open differential leaves a lot to be desired when encountering staggered holes or slippery surfaces off-road. You have likely put your vehicle in a situation where two tires (one front and one rear) spin uselessly and the tires that have traction don't move. Nothing is wrong with the vehicle. Installing traction-adding devices in the axles will keep this from happening. The traction-adding devices will split the torque to both tires. If you go with a locker in one or (better yet) both axles, you'll have 100 percent of the engine's torque available at each tire, regardless of the terrain. Now, the problem is that there aren't any lockers available for the frontend of your 4x4. The IFS frontend and steering system is generally considered to be too weak to handle the added traction of a locker. In the rear you have several traction-adding options. Check out "Making Traction" online at [fourwheeler.com](http://fourwheeler.com) to help you decide which traction-adding device is right for you.

## BEADLEGAL OR NOT

**Q** As a long-time reader, very long-time wheeler, and president of a 41-year-old Colorado-based 4x4 club, I am confused by conflicting information I've read recently. In "Beadlock Input" (May '15), John Cappa writes that clamp-on style beadlock wheels, such as ATX, Champion, TrailReady, and so on "are generally not D.O.T. compliant (not street legal)". However, in the June '15 issue



of your sister publication (*4-Wheel & Off-Road*), in "Top 10 4x4 Myths," myth number six reads "Beadlock Wheels Are Not D.O.T. Approved: TrailReady, B.A.D., Raceline, and so on, all make D.O.T.-approved aluminum beadlock rims that are cast specifically as a beadlock" and "The D.O.T. does not have any regulations directly related to beadlock rims".

It has long been understood by most in the 4x4 community that our beadlocks make our rigs illegal on the street, but that enforcement is rare. While it is certainly prudent to err on the conservative side, it would be nice to know what the real truth is.

JOHN "MAD COW" HEMBEL  
HICOUNTRY 4 WHEELERS  
VIA EMAIL

**A**Unfortunately (or fortunately for *Four Wheeler*), *4-Wheel & Off-Road* is misinformed on a few things. First, the Department of Transportation (D.O.T.) does not approve or reject any wheel for on-road use. The D.O.T. simply has a set of guidelines, specs, and measurements that street legal wheels need to adhere to. Wheels can only be D.O.T. compliant or not. There is no stamp of approval from the D.O.T. on the wheel. Second, and most important is that the D.O.T. wheel specifications are very specific about the design and dimensions of a compliant wheel. Just because the wheel is cast with the beadlock lip, does not make it D.O.T.-compliant. The D.O.T. specifies the dimensions and design of the bead area, the arc, and the thickness of the safety bead where the tire is seated. Anything outside the specified parameters is not considered D.O.T.-compliant and therefore not useable for street use in most cases. As you are aware, most clamp-on beadlock wheels feature a significantly different bead-retention design than a traditional wheel with a standard D.O.T.-compliant safety bead. Now, none of this necessarily means that clamp-on beadlock wheels are unsafe for street use. They simply don't match a set of specifications that the D.O.T. says meet compliance.

Most states are pretty flexible when it comes to beadlock wheels. We have really only run into a few officers in Moab that seem to care about beadlock legality, and interestingly enough, only during the week of Easter Jeep Safari. Now, what is really interesting is that some law-enforcement officers have told us that they cannot write an equipment violation for something like beadlock wheels if you are not in the state your vehicle is registered. That means if you are from out of state, it may not be legal for a Utah officer to write you a ticket for something like using beadlock wheels on the street. Your vehicle could be perfectly legal in the state it's registered, the officer would not know, because different states often have different laws. However, it's probably not a great idea to argue with the officer at the time

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## TECHLINE

of the ticket. It's said that a good officer can find up to three equipment violations on even a brand-new vehicle still sitting on the dealer lot. No point in letting an argument lead to your vehicle getting impounded. That said, be sure to educate yourself and possibly fight the ticket on the back end. The good news is if you don't want to get hassled at all, there are many D.O.T.-compliant beadlock wheels and inner tires available that will keep your tires from unseating at low pressures.

### GO BIG?

I live in Colorado and own a '97 4x4 Dodge Ram 2500 with a 12-valve Cummins and a five-speed manual transmission. The truck has a Dana 80 rearend and Dana 60 frontend. It's lifted 5-6 inches and sits on 35-inch tires. It needs transfer case work, the steering box replaced, and a clutch. Should I fix these issues, put 40s on it, and wheel it? It's already beat up, so body damage isn't an issue, but it is big and heavy and the trails can be tight in Colorado. Or, should I sell it and build something smaller?

I will have a mildly built Jeep XJ Cherokee with 33-inch tires to go camping in and do easier trails. I like how the Dodge would be different, but like I said, I don't want it to be too big to do some of the harder trails. I figured you might have some good advice, since you owned a '73 J-2000 on 49-inch tires. Thanks for your advice.

PATRICK KOLTERMAN  
VIA FACEBOOK.COM/JOHNCAPPA4X4

It really comes down to personal preference. Personally, I like the idea of driving a fullsize truck on the trail. You instantly stand out from a sea of modified JK Jeep Wranglers. You can also carry quite a bit more gear and firewood for camping, repairs, and recovery. However, the truck you have is somewhat desirable for those that love the 12-valve Cummins engine backed up with a manual transmission for towing. Some people might consider it a sin to beat it up on the trail, depending on how beat up the body already is. Something to keep in mind is that the issues you have with the Dodge are known, and relatively easy to fix. You won't need to make many strength upgrades because the truck essentially already has 1-ton running gear. If you buy another 4x4 to build up, it could have several unknown issues that you'll have to find out about and fix. A smaller rig will also require a few axle and other upgrades. Now, if it were mine and the body was fairly clean, I might consider fixing the minor issues and make it my tow rig. But if it's beat up and rusty, maybe consider adapting an M101A2 military trailer bed for more clearance and make it a really cool and original-looking trail rig.

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## THROTTLE STICK

**Q**I have a tech issue on my '04 Jeep Rubicon. The throttle keeps sticking intermittently at 2,000 rpm when driving. I have replaced the IAC, TPS, and MAP. All vacuum lines are connected and serviceable. The rpm returns to normal when you stab the throttle. There are no codes. The cable seems to be moving freely. Any tips to get it unstuck? Where can I get another throttle body if I need one? I'm not thrilled at the idea of dropping \$600 on a new throttle body.

DAREK CONNOLE

VIA FACEBOOK.COM/JOHNCAPELLA4X4

**A**It really sounds like something is hanging up the pedal, cable, or linkage. I'd double check all of that. Carpet and floor mats can get wadded up around the throttle pedal, the cable can get sticky, and debris like sticks and leaves could cause the linkage to get hung up. It's also possible that the throttle shaft is gummed up and sticking. While unlikely, there might be a solenoid that bumps up the throttle when the A/C is on. Maybe check and see if that's sticking.

If you find that you need a new throttle body, you can locate good used ones for far less than \$600. Your best bet is to call a local Jeep-specific wrecking yard or hit eBay (ebay.com). Good used 4.0L throttle bodies should be easy to come by. I've seen them priced anywhere from \$25 to \$50 on eBay.

## MANUAL TO AUTO SWAP

**Q**I own a '71 Ford Bronco with the original three-speed manual transmission and transfer case. I would like to swap in an automatic tranny. What would be the best setup without a lot of changes underneath? I know that the C4 was available in some Broncos, but they are very hard to find.

LISA AND DOUG LETTERER  
VIA EMAIL

**A**The '73-'77 early Broncos had the option of a C4 automatic transmission. James Duff (jamesduff.com), Jeff's Bronco Graveyard (broncograveyard.com), and Wild Horses (wild-horses4x4.com) all offer parts to help make the swap to an automatic transmission. Before purchasing a transmission, be sure to talk to one of these companies since not all C4 transmissions can be adapted easily to your Bronco. Other components you'll need include the proper flexplate, torque converter, starter, transmission cooler, transmission lines, shifter, transfer case input shaft, Neutral safety switch, and pedal assembly. You may also need a new carburetor to make use of the throttle kick-down. There are many smaller items that add up when making a swap like this. FW

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**TUFF COUNTRY**

- Shocks sold separately  
4WD GM 2500HD 11-15 6" \$2,172 01-10 4" \$1,180  
4WD GM 1500 07-13 4" \$694 14-15 4" \$589  
07-13 4WD Dodge 25/3500 4.5" \$745 6" \$831  
09-14 Ram 1500 4" \$718 6" from \$2,302 \$2,339  
4WD Dakota, Durango 5.5" \$1,308 to 1,341  
09-14 4WD F150 2" \$182 3" \$551  
4WD Super Duty 05-07 6" \$1,196 08-15 6" \$812  
04-14 Nissan Titan 4" \$763  
Tundra 99-06 4.5" from \$1,255 07-15 6" \$1,875  
Tacoma 6-Lug 95-04 5" \$1,498 05-15 6" \$1,299

**SKYJACKER**

- Shocks sold separately  
4WD GM 8-Lug 11-15 7" \$2,022 01-10 6" \$1,763  
4WD GM 1500 14-15 4" \$1,302 6" \$7" \$1,475  
4WD GM PU 6-Lug 99-06 6" \$1,573 07-13 6" \$1,545  
4WD Dodge 1500 06-08 4" \$1,139 09-14 4" \$1,663  
Ram 2500 03-13 3" \$567 5" \$1,361 14-15 4" \$999  
Ram 3500 03-12 3" \$567 13-15 4" \$809 6" \$999  
F150 6" 97-03 \$1,772 04-08 \$2,359 09-14 \$1,405  
2015 4WD F150 w/ shocks 4.5" \$1,405 6" \$1,505  
SuperDuty 08-10 4" \$842 6" \$974 11-15 6" \$870  
Tundra 99-06 3" \$364 07-15 4.5" \$1,255 6" \$1,305  
97-06 Wrangler TJ 2.5" \$387 4" \$499 6" \$1,900  
07-15 JK Wrangler 4"-5" \$626 6"-7" \$2,319

**VERCO**

- with Bilstein shocks  
07-13 GM 1500 PU 6" 2WD \$1,949 4WD \$2,119  
01-10 4WD GM 8-Lug Pickup 6" \$1,968  
F150 4WD 97-03 4.5" \$1,700 04-08 4.5" \$2,699

**ZODIAC**

- Shocks included  
GM 8-Lug pickup 01-10 6" \$1,295 11-15 5" \$1,399  
GM 1500 4.5" & 6.5" 07-13 \$1295 14-15 \$1,195  
12-15 4WD Dodge 1500 4" \$1,409 6" \$1,519  
09-11 4WD Dodge 1500 4" \$1,599 6" \$1,699  
Ram 2500 03-08 \$770 09-13 \$1,127 14-15 \$1,124  
Ram 3500 03-08 \$770 09-12 \$1,105 13-15 \$874  
03-12 4WD Dodge 25/3500 5" \$770 8" \$1,329  
F150 6" 97-03 \$1,295 04-08 \$1,399 09-13 \$1,549  
F150 2014 6" \$1,299 2015 6" \$1,349  
Super Duty 99-04 4" \$809 05-15 4" \$799  
97-06 Wrangler TJ 3" \$459 4" \$529  
07-15 Wrangler JK 3" \$439 4" \$575 5" \$1,299  
07-15 Tundra 5" \$1,299 05-15 Tacoma 6" \$1,249

**TRAXDA**

- Shocks sold separately  
99-15 2&4WD IFS GM Pickup 1"-3" \$57 to \$140  
Dodge 4WD 1500 02-05 2"-3" \$1,519 06-14 2" \$129  
14-15 Ram 2500 / 13-15 3500 2.5" \$230 3.5" \$372  
97-14 2&4WD F150 2"-3" \$110 to \$139  
F250, F350 05-10 2.5" \$129 11-15 2.5" \$149  
Tacoma, Tundra 3" \$155 FJ Cruiser 3" \$155

**FEARTECH**

- Shocks included  
11-15 4WD GM 2500/3500HD 4" \$1,204 6" \$1,222  
4WD GM 8-Lug 01-10 6" \$2,220 01-08 8" \$2,233  
07-15 2&4WD GM 1500 4" \$720 6" from \$1,599  
2015 Colorado Collover leveling kit 2" \$1,975  
4WD Ram 2500 5" to 6" 2003-15 From \$1,260 to \$1,322  
4WD Ram 3500 5" to 6" 2003-15 From \$1,125 to \$1,322  
4WD F150 97-03 6" \$2,288 04-08 6" \$2,311  
F150 09-13 4" \$1,543 6" \$1,987 14-15 6" \$1,699  
08-15 4WD SuperDuty 4" \$857 6" \$1,204 8" \$1,319  
05-07 4WD SuperDuty 4" \$876 6" \$1,192 8" \$1,378  
07-15 Tundra 6" \$2,300 05-13 Tacoma 6" \$2,097  
Nissan Titan 6" \$1,804 Fronter 6" \$2,188  
Wrangler 97-06 4" \$1,178 07-15 3" \$691 5" \$1,762

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## CALENDAR

COMPILED BY KEN BRUBAKER [KEN.BRUBAKER@FOURWHEELER.COM](mailto:KEN.BRUBAKER@FOURWHEELER.COM)

### July 31-August 2

**What:** 37th Annual Jeep Jamboree

**Where:** Georgetown, California

**Hosted by:** Jeepers Jamboree

**Info:** [jeepersjamboree.com](http://jeepersjamboree.com)

### August 1

**What:** Getting Started Off-Road Driving

**Where:** Gorman, California

**Hosted by:** Badlands Off-Road Adventures

**Info:** [4x4training.com](http://4x4training.com)

### August 1

**What:** Mud Bogs/Tuff Truck Series

**Where:** Lancaster, Pennsylvania

**Hosted by:** Buck Motorsports Park

**Info:** [buckmotorsports.com](http://buckmotorsports.com)

### August 1-2

**What:** Lucas Oil Off Road Racing Series

**Where:** Ensenada, Mexico

**Hosted by:** Lucas Oil

**Info:** [lucasoiloffroad.com](http://lucasoiloffroad.com)

### August 1-2

**What:** W.E. Rock Western Series Rock Crawling

**Where:** Goldendale, Washington

**Hosted by:** World Extreme Rock Crawling Championship Series

**Info:** [werocklive.com](http://werocklive.com)

### August 4-5

**What:** TORC Battle At The Chip

**Where:** Sturgis, South Dakota

**Hosted by:** The Off-Road Championship

**Info:** [torcseries.com](http://torcseries.com)

### August 6-8

**What:** 17th Annual 4x4 Blast

**Where:** Pittsfield, Illinois

**Hosted by:** Two Rivers Jeep Club

**Info:** [trjc.com](http://trjc.com)

### August 6-9

**What:** Sierra Trek

**Where:** Truckee, California

**Hosted by:** California Association of Four Wheel Drive Clubs

**Info:** [cal4wheel.com](http://cal4wheel.com)

### August 6-9

**What:** 18th Rubicon Trail Jeep Jamboree

**Where:** The Rubicon Trail, California

**Hosted by:** Jeep Jamboree USA

**Info:** [jeepjamboreeusa.com](http://jeepjamboreeusa.com)

### August 7-9

**What:** Rock Race Competition

**Where:** Naples, Idaho

**Hosted by:** North Idaho Mud and Crawl

**Info:** [northidahomudandcrawl.blogspot.com](http://northidahomudandcrawl.blogspot.com)

### August 7-9

**What:** Carlisle Truck Nationals

**Where:** Carlisle, Pennsylvania

**Hosted by:** Carlisle Events

**Info:** [carlisleepvents.com](http://carlisleepvents.com)

### August 7-9

**What:** Trucks Gone Wild at Barnyard All Terrain

**Where:** Livermore, Maine

**Hosted by:** Trucks Gone Wild

**Info:** [trucksgonewild.com](http://trucksgonewild.com)

### August 8

**What:** East Coast Truck & Tractor Pull

**Where:** Lancaster, Pennsylvania

**Hosted by:** Buck Motorsports Park

**Info:** [buckmotorsports.com](http://buckmotorsports.com)

### August 8-9

**What:** Summer Slam

**Where:** Gore, Virginia

**Hosted by:** Big Dog Productions

**Info:** [bigdogsoffroad.com](http://bigdogsoffroad.com)

### August 10

**What:** Rubicon Trail Adventure

**Where:** Lake Tahoe, California

**Hosted by:** Badlands Off-Road Adventures

**Info:** [4x4training.com](http://4x4training.com)

### August 13-15

**What:** General Tire Vegas to Reno

**Where:** Las Vegas, Nevada

**Hosted by:** Best in the Desert Racing Association

**Info:** [btid.com](http://btid.com)

### August 14-16

**What:** Jeep Jam

**Where:** Wilmington, Ohio

**Hosted by:** Muddy Buddys Jeep Wrangler Club

**Info:** [muddybuddys.net](http://muddybuddys.net)

### August 14-16

**What:** Bloomsburg Nationals

**Where:** Bloomsburg, Pennsylvania

**Hosted by:** Carlisle Events

**Info:** [carlisleepvents.com](http://carlisleepvents.com)

### August 15

**What:** W.E. Rock Eastern Series Rock Crawling

**Where:** Ardmore, Oklahoma

**Hosted by:** World Extreme Rock Crawling Championship Series

**Info:** [werocklive.com](http://werocklive.com)

### WHERE TO SEND SUBMISSIONS

Address your correspondence to: **Calendar, Four Wheeler, 831 S. Douglas St., El Segundo, CA 90245**, or email [ken.brubaker@fourwheeler.com](mailto:ken.brubaker@fourwheeler.com). All submissions become the property of Four Wheeler, and we reserve the right to edit them for length, accuracy, and clarity. The editorial department can also be reached through the website at [www.fourwheeler.com](http://www.fourwheeler.com). Due to the volume of mail, electronic and otherwise, we cannot respond to every reader, but we do read everything.

**August 15**

**What:** Diesel Pick-Up Powerfest Series  
**Where:** Lancaster, Pennsylvania  
**Hosted by:** Buck Motorsports Park  
**Info:** buckmotorsports.com

**August 16**

**What:** Dirt Riot Endurance Racing  
**Where:** Ardmore, Oklahoma  
**Hosted by:** World Extreme Rock Crawling Championship Series  
**Info:** werocklive.com

**August 20-22**

**What:** 7th Big Horn Mountains Jeep Jamboree  
**Where:** Dayton, Wyoming  
**Hosted by:** Jeep Jamboree USA  
**Info:** jeepjamboreeusa.com

**August 22-23**

**What:** Vehicle Recovery Skills Clinic  
**Where:** Rancho Cordova, California  
**Hosted by:** Off-Road Safety Academy  
**Info:** discoveroffroading.com

**August 22-23**

**What:** Truck & Jeep Fest  
**Where:** Orlando, Florida  
**Hosted by:** 4 Wheel Parts  
**Info:** 4wheelparts.com

**August 22-23**

**What:** Lucas Oil Off Road Racing Series  
**Where:** Sparks, Nevada  
**Hosted by:** Lucas Oil  
**Info:** lucasoiloffroad.com

**August 27-29**

**What:** Ojibwe Forests Rally  
**Where:** Detroit Lakes, Minnesota  
**Hosted by:** Rally America  
**Info:** rally-america.com

**August 28-30**

**What:** Scheid Diesel Extravaganza  
**Where:** Terre Haute, Indiana  
**Hosted by:** Scheid Diesel Service Company  
**Info:** scheiddiesel.com

**August 29**

**What:** Monster Truck Show/Tuff Truck Series  
**Where:** Lancaster, Pennsylvania  
**Hosted by:** Buck Motorsports Park  
**Info:** buckmotorsports.com

**August 29-30**

**What:** Trail-Gear Western Regional Series w/ VORRA Desert Race  
**Where:** Fallon, Utah  
**Hosted by:** Ultra 4 Racing  
**Info:** ultra4racing.com

**August 29-30**

**What:** Iron Range Off-Road Driving School  
**Where:** Gilbert, Minnesota  
**Hosted by:** Iron Range Offroad  
**Info:** ironrangeoffroad.com FW

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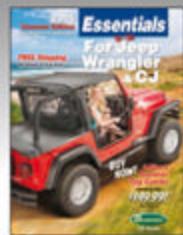
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# December 1998: The ABCs Of Winch Respooling

**M**any of the stories we publish are timeless and are as applicable today as they were when we wrote them years ago. Seventeen years ago, in the Dec. '98 issue, we wrote a story about respooling winch cable, and the story is as relevant today as it was then.

What's the big deal about respooling winch cable? Well, improperly spooled winch cable can cause all kinds of problems. Binding and fraying are the two most common problems that could be remedied by winding the cable properly on the drum. We're guilty of ignoring proper winch respooling. If you sauntered out to our Dodge Power Wagon and took a gander at the winch, you'd see that the cable resembles a road map of Vermont. There's cable going every which way. We use the winch quite often, and its common practice for us to forget to properly respool after we finish with a recovery. The worst is when we go to use the winch again and we're stopped cold by bound cable or some other glitch. Ugh.

One of the first things the story notes is that respooling winch cable isn't about aesthetics. "Sure, a correctly wound winch cable looks better than one that's just reeled in at random, but the important part is function. A loosely wound cable tends to cut into the layers underneath when under tension, fraying it and creating kinks in the process," we wrote. Your buddies may poke fun at you for having a tight, symmetrically wound winch cable ("Hey man, you just got that winch up there as an ornament?"), but this is one of those occasions where something that is aesthetically pleasing on your 4x4 is actually functional.

When it came to recommendations for respooling winch cable, we noted that the easy process begins by "reeling out all but the last few wraps of cable." "Attach the hook to a sturdy anchor point (another vehicle, or a rock or tree, using appropriate straps or attachment points) that allows for a straight path between the winch-equipped vehicle and anchor point," we said. We recommended using the e-brake or some



**“IF YOU SAUNTERED OUT TO OUR DODGE POWER WAGON AND TOOK A GANDER AT THE WINCH, YOU'D SEE THAT THE CABLE RESEMBLES A ROAD MAP OF VERMONT.”**

other means to create drag as the vehicle moves forward while the winch cable is respoled. "It's easier to have one person steering the vehicle right and left as needed to get the cable to wrap nice and tight, but doing it solo is also feasible; it may just take a bit longer," we noted. We have respoled

winch cable by ourselves when dragging the vehicle, but it's important to note that for an extra degree of safety, it's always recommended to have someone behind the wheel. "Be sure to guide the cable all the way to the ends of the drum before letting it start the next layer. You don't want any voids in the layers that the cable can later dig into," we wrote when referencing the actual process of respooling the cable. The respoled winch cable should be tightly wound side to side and "built-up" on the drum.

As we read this timeless story we were reminded that, once again, a small amount of preventative maintenance can make a big difference in the long run. It also reminded us to respool the winch cable on our Power Wagon. **FW**

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